

**THEORETICAL FOUNDATION OF COMPUTER SCIENCE**  
**PAPER - I : DISCRETE MATHEMATICS**  
**MAX MARKS : 50**

**NOTE :-** The Question paper setter is advised to prepare unit-wise question with the provision of internal choice. Only simple calculator is allowed not Scientific calculator.

**UNIT - I** Recall of statements and logical connectives, tautologies and contradictions. logical equivalence, algebra of propositions quantifiers, existential quantifiers and universal quantifiers.

**UNIT - II** Boolean algebra and its properties, algebra of propositions as an example, De Morgan's Laws, partial order relation g.l.b., l.u.b, Algebra of electric circuits and its applications. Design of simple automatic control system.

**UNIT - III** Boolean functions - disjunctive and conjugative normal forms. Boolean's expansion theorem, fundamental forms. Many terminal Networks.

**UNIT - IV** Arbitray Cartesian product of sets. Equivalence relations, partition of sets, injective, surjective, bijective maps, binary poerations, countable, uncountable sets.

**UNIT - V** Basic Concept of Graph Theory, Sub graphs, Trees and their properties, Binary Tress, Spanning Trees. Directed Trees, planar grapha, Euler Circuit, Hamiltonian Graph Chromatic number.

**PAPER - II : CALCULUS AND STATISTICAL METHODS**

**NOTE :-** The Question paper setter is advised to prepare unit-wise question with the provision of internal choice. Only simple calculator is allowed not Scientific calculator.

**UNIT - I** Limits, Continuity and differentiability of function (s) of one variable, First and second kind of discontinuities.

**UNIT - II** Differentiation of Functions, Differentiation of functions of functions, parametric functions, product of functions, function in Product and quotient form, Logarithmic differentiation, Differentiation of Parametric functions.

**UNIT - III** Tangent & Normal. Subtangent, Subnormal, Monotonic Increasing and Decreasing function. Simple examples of Maxima and Minima.

**Statistical Methods**

**UNIT - IV** Probabilillity - sample space, Types of events (mutually exclusive, equally, likely event, favorable events. dependent and independent events) composition of events, additive and multiplicative law if probability, conditional probability, inverse probaility. Bays Theorem.

**UNIT - V** Frequency distribution and measures of dispersions, Binomial, Poisson and Normal distrubution. Curve fitting and Principle of least square, Correlation and Regressions lines.

## **THEORETICAL FOUNDATION OF COMPUTER SCIENCE PAPER - III : INTRODUCTORY ELECTRONICS**

**MAX MARKS : 50 NOTE :-** The

Question paper setter is advised to prepare unit-wise question with the provision of internal choice.

### **UNIT - I SEMICONDUCTORS & INTEGRATED CIRCUITS -**

Introduction to semi conductors & its types, Diode NPN transistors, CE amplifier & Switching characteristics of Transistors, Logic families, Scale of integration, RTL, DTL, TTL, and its characteristics.

### **UNIT - II INTEGRATED CURCUIT FABRICATION - Integrated**

circuits technology - Advantage and limitations of Integrated circuits, Basic monolithic integrated circuit technology.

### **UNIT - III DATA REPRESENTATION - Data types, number systems,**

fixed point representation, 1's and 2's complements, Binary fixed point representation, arithmetic operation on binary operation, Overflow and underflow, codes, ASCII, EBCDIC codes, Grey codes, Excess - 3, BCD codes, Error detection and correcting codes.

### **UNIT - IV LOGIC GATES AND BOOLEAN ALGEBRA - Logic**

gates AND, OR, NOT gates and their truth tables, NOR, NAND and XOR gates, Boolean algebra, basic Boolean Law, theorem, Map Simplification, Minimizing technique, K-Map, Sum of product, Product of sum.

### **UNIT - V COMBINATOINAL & SEQUENTIAL LOGIC CIRCUITS -**

combinational and sequential circuits, binary adder, subtractor, Flip flop - RS, D, JK, and T flip flop, data & shift register,encoder, decoder,comparator, Multiplexer, Demultiplexer, RAM & ROM.

## **FUNDAMENTALS OF IT & O.S.**

**MAX MARKS : 100**

**MIN. MARKS : 40**

**NOTE :-** The Question paper setter is advised to prepare unit-wise question with the provision of internal choice.

### **UNIT - I Introduction to Computers**

Computer System Characteristics and Capabilities : Speed, Accuracy, Reliability, Memory capability,

Repeatability. Computer Hardware and Software : Block

Diagram of a Computer, Different Types of Softwares, Data Processing: Data, Data Processing System. Storing Data, Processing Data, Types of Computers : Analog, Digital, Hybrid General and Special Purpose Computers.

Computer Generations: Characteristics of Computer Generation Computer Systems - Micros, Minis & Main - frames. Introduction to a PC : The IBM Personal Computer Types of PC systems PC, XT & AT Pentium PC's Limitations of Micro Computer.

## UNIT - II COMPUTER ORGANIZATION :

Introduction to Input Devices : Categorizing Input Hardware, keyboard, Direct Entry card Readers, Scanning Devices - O.M.R, Character Readers. MICR, Smart Cards, voice Input Devices, Pointing Devices - Mouse, Light Pen. Storage Devices : Storage Fundamentals, Primary and Secondary Storage, Data Storage and Retrieval Methods - Sequential, Direct & Indexed Sequential, Tape Storage and Retrieval methods Tape storage Devices, characteristics and limitations, Direct access Storage and Micro computers - Hard Disks, Disk Cartridges, Direct Access Storage Devices for large Computer systems. Mass storage systems and Optical Disks, CDROM. Central Processing Unit : The Microprocessor, control unit, A.L.U Registers, Buses, Main Memory, Main Memory ( RAM) for microcomputers, Read Only Memory (ROM) Computer Output : Output Fundamentals, Hardcopy Output Devices, Impact Printers, Non-Impact Printers, Plotters, Computer output Microfilm/Microfiche (COM) systems, Softcopy Output Devices, Cathode Ray Tube, Flat Screen Technologies.

## UNIT - III Computer Software :

System Software : System software Vs. Application Software, Types of System Software, Introduction and Types of Operation Systems programs, Booting Loader, Diagnostic Tests, Operating Systems Executive, BIOS, Utility Programs, File Maintenance, Language Processors, Assembler, Compiler & Interpreter. Application Software : Microcomputer Software, Interacting with the System. Trends in PC software, Types of Application Software, Difference between program and packages.

## UNIT - IV Microsoft Disk Operating System :

Introduction, History and Versions of DOS. Fundamentals of DOS : Physical Structure of the Disk, Compatibility of drives, Disks & DOS versions, preparing Disks for use, Device Names. Getting Started with DOS : Booting Process (DOS, Windows, Unix), System Files and Command.com, Internal DOS Commands - DIR, MD, CD, Copy, DEL, REN, VOL, DATE, TIME, CLS, PATH, TYPE. Files & directories, Elementary External DOS Commands - CHDDSK, MEM, XCOPY, PRINT, DISKCOPY. DISKCOMP, DOSKEY, HELP, TREE, SYS,

LABEL, ATTRIB, Creating a Batch Files, Additional  
 Commands - ECHO, PROMPT, EDIT,  
 FORMAT, FDISK, BACKUP, RESTORE, MORE,  
 SORT, APPEND. Introduction to Unix OS, Basic commands eg  
 pwd, is, cat, pg, who, ps, mail, cal, File commands - Is, cat,  
 tail, cp, mv, rm, file, type.

**UNIT - V Overview of GUI & Windows OS :**

Introduction to GUI and various versions of MS  
 windows 98, Windows XP, Windows 2000, Windows Vista,  
 Workgroups and domains, Quick launch toolbar, Windows  
 Flip, 3D navigation, Desktop, Internet  
 explorer 7.0, networking geatures (Sharing files), managing  
 programs and multimedia, control panel, Speech recognition and  
 Dictation, Handling user accounts, Security and protection  
 fatures, management tools (updating,  
 diagnosing, configurations, backup and recovery,  
 upgrading windows vista) OLE Concept, Comparative  
 study of Linux, DOS and Windows, features of Windows Vista,  
 reliability, migrating the data.

**PROGRAMMING IN 'C' LANGUAGE**

**Max Marks : 100**

**Min. Marks : 40**

**NOTE :-** The Question paper setter is advised to prepare unit-  
 wise question with the provision of internal choice.

**UNIT - I Fundamentals of C programming - Overview of C :** History of

'C' Structure of 'C' program. Keywords, Todens, Data types, Constants,  
 Literals and Variables, Operators and Expressings : Arithmetic operators,  
 Relational operator, Logical operators, Expressions : Operator :  
 Operator precedence and associativity, Type casting, Console I/O formatting,  
 Unformatted I/O functions : getch ( ), getchar, getche ( ), getc ( ), putc  
 ( ), putchar ( ).

**Control Constructs :** If - else, conditional operators, switch and  
 break, nested conditional branching satatements, loops: For, do-- while,  
 while, Nested loops, break and continue, goto and label, exit function.

**UNIT - II Arrays, Strings and Functions :** Array :- Array declaration, One  
 and Two dimensional numeric and character arrays. Multidimensional arrays.

**String :-** String declaration, initialization, string  
 manipulation with/without using library function.

**Functions :-** definition, function components : Function arguments,  
 return value, function call statement, function prototype. Type of function  
 arrangement :return and argument, no return and no argument,  
 return and no argument, no return and argument. Scope and lifetime of  
 variable. Call by value and call by reference. Function using arrays, function  
 with command line argument. User defined function : maths and  
 character functions, Recursive function.

**UNIT - III Structure, Union & Enum - Structure :** basics, declaring structure and structure variable, typedef statement, array of structure, array within structure, Nested structure; passing structure to function, function returning structure. **Union:** basics, declaring union and union variable, **Enum :** declaring enum and enum variable.

**UNIT - IV Dynamic Data Structures in 'C' - Pointers :** definition of pointers, pointer declaration, using & and operators. Void pointer, comparison. dynamic memory allocation functions - malloc, calloc, realloc and free, pointer Vs. Arrays, Arrays of pointer., pointer to array, pointers to functions, function returning pointer, passing function as argument to function, pointer to structure, dynamic array of structure through pointer to structure.

**UNIT - V File Handling and Miscellaneous Features - File** handling : file pointer, file accessing functions, fopen, fclose, fputc, fgetc, fprintf, fscanf, fread, fwrite, feof, fflush, rewind, fseek, ferror. File handling through command line argument. Introduction to C preprocessor # include, #define, conditional compilation directives: #if, #else, #elif, #endif, #ifndef etc.

**INTRODUCTION TO PC SOFTWARE & INTERNET APPLICATIONS**  
**MAX MARKS : 100** **MIN MARKS : 40**

**NOTE :-** The Question paper setter is advised to prepare unit-wise question with the provision of internal choice.

**UNIT - I Using Office 2007 MS-Word- Creating and editing** word documents, formatting documents - aligning documents, indenting paragraphs, changing margin, formatting pages, formatting paragraph, printing labels, working with tables, formatting text in tables, inserting and deleting cells, rows and columns, use bulleted and numbering, checking spelling and grammar, finding synonyms, working with long documents, working with header and footer, adding page number and foot note, working with graphics, inserting clip art, working with pictures, Word art, creating flow chart, creating word templates, creating templates, working with mail merge, writing the form letter, merging form documents, selecting merge records, creating macros, running macro.

**UNIT - II working with MS-Excel -** Introducing Excel, use of excel sheet, saving, opening and printing work book, Apply formats in cell & text, Divide worksheet into pages setting page layout, adding Header & Footer. Using multiple documents, arranging windows i.e. (Cascade, Tiled, Split) Protecting your work. Password Protection Working with Functions & Formulas, using absolute reference, referencing cell by name , using cell label, giving name to cell and ranges,

working with formulas (mathematical & trigonometric, statistical, date time. most recently used), Working with Excel graphics, creating chart & graphs, filtering a data base using auto filter criteria range, calculating total and subtotal, creating pivot table, goal seek, recording & playing macros, deleting and selecting macro location.

**UNIT - III Working with MS-Power Point & MS-Access** - Presenting with Power Point - Creating presentation, working with slides, different types of slides, setting page layout. selecting background and applying design, adding graphics to slide, adding sound and movie, working with table, creating chart and graph, playing a slide show slide transition, advancing slides, setting time, rehearsing timing, animating slide, animating objects, running the show from windows. MS-Access - Creating tables in Access, defining datatypes, creating relationships, manipulating records.

**UNIT - IV Introduction to HTML and Designing Web Page using MS-Frontpage** - Concept of website, web standards, what is HTML, HTML documents/files. HTML editor explanation of the structure of home page, elements in HTML document, HTML elements, HTML tags and basic HTML tags, viewing the source of webpage. And downloading the webpages source

**Image, Internal and external linking between web pages** - IMG elements. Features of Front page 2000, Designing web page, working with views, Hyperlinks, setting Hyperlink, using List, themes, tables, Frames, style sheet, working with forms, page Templates, frame templates, anchor, working with banners, Dynamic effect, How to publishing webpages in local area network.

**UNIT - V Animations and Graphics** : Basic Concept of 2D/3D Animation, Principle and application in Multimedia, Hardware & software resources requirement for animation, steps for creating generic animation. Learn the basic of Flash Animation;

**Creating a new movie** : Get set Up, Input Text, Animate Text, Drawing and painting with tools, brush, create basic shapes like Oval. Rectangle & Polystar Tools, tools working with object & filling the object, Transformation, object properties dialog box, creating layers motion tweening, shape tweening, mask layers, basic action scripts, importing sound through Flash.

**Interface of Photoshop** : The Photoshop workspace use of menus palettes and toolbox, creation new images, using selecting tools, lasso tool, Direct select Lasso, convert point tool, image adjustment through Photoshop.

**NOTE :- The Question paper setter is advised to prepare unit-wise question with the provision of internal choice.**

**UNIT - I Introduction to visual Basic** : Hardware requirements, features of VB, Editions of Visual Basic, and Event Driven Programming vs procedure oriented programming.

Introduction to Integrated Development  
of Visual Basic

Environment. Basic concepts

programming : Controls, properties, methods, events,  
forms, projects. Creating Executable files.

Variables, constants, data types, data conversion  
function, scope of variables Operators

**Control Structure :** Conditional / branching

statements: if--- else--endif, Select case Looping

statements: do--while, for-- next, for each, exiting a loop, goto  
statement, msgbox and input box functions.

**UNIT - II Arrays :** types of arrays, array manipulation, Working

with standard controls. Working with control array, various

key and mouse events, using drag and drop concepts. Procedure and

Functions : types of function, library function, date and time function,

format function, and string related function, validation

function. Creating user defined function & procedure, call

by value and call by reference, concept of recursion, working with

basic module, class module and form module.

**UNIT - III Working with Advanced Controls :**

toolbar, status bar, tabbed dialog controls, progress bar,

animation controls, dtpicker,calendar, calendar, common dialog control.

SDI & MDI Application : creating MDI application, menu

editor : defining menu & popup menu, sub main, startup objects.

Working with graphics control and using graphic

methods.

**UNIT - IV Error Handling :**Types of errors, error trapping tools :

watch window, local window, immediate window, debug menu,

tracing program flowwith call stack, the error object error function,

error handling routines : on error goto statements.

**File Handling :** type of file handling, Sequential file

handling: reading, writing and appending in file,

understanding user defined data type, Random access file:

reading writing and appending in file.

**UNIT - V Data Access Using the ADO data Control :**

Basic concepts of relational database, visual data

manager, introduction to SQL, concept of ODBC, Overview

of DAO and RDO, Using DAO and RDO to access data. ADO

features, difference among ADO, DAO and RDO, accessing and

manipulating database using ADO, ADO object hierarchy, concept

of recordset and its type, connection object, command object.

**Data Environment :**accessing data using data environ

ment, usingDatagrid, Data combo, data list, MSHF lexgrid.

**Report Generation :** Overview of Data Report,

creating Data report, adding groups, using data report functions.

Introduction to Crystal Report Writer.

**COMMUNICATION SKILLS**

**NOTE :-** The Question paper setter is advised to prepare unit-wise question with the provision of internal choice.

**Objective :** This course is designed to enable the students of computer education to speak and write English with a fair degree of grammatical correctness. The inputs in the course contents are related to spellings, meanings of words and the correct use of words relating to the field of computer and other areas of Knowledge.

**UNIT - I** Vocabulary, Knowledge of at least one thousand words - their spelling, meanings and usage, Phrases.

**UNIT - II** **Structure of sentences** - Simple, Complex and compound. Clauses and Subordinate clauses

**UNIT - III** The tenses and aspects. The modal, the gerund, the participle, the infinitive.

**UNIT - IV** **Transformation of sentences :-**

1. Interchange of Active and Passive voice.
2. Interchange of Affirmative and Negative Sentences.
3. Interchange of Explanative and Assertive Sentences.
4. Interchange of interrogative and Assertive sentences.
5. Direct and Indirect Speech.

**UNIT - V** Practical Application of grammar. Practice in talks, conversation and

writing. Report writing. Writing of applications. Letter writings, Description of events.

Books:

1. Living English Structure - by W.S. Allen.
2. A Practical English Grammar - by Thomson and Martinet.

**Testing Pattern :-** The question paper will clearly specify units and will have questions from unit I to IV. Unit V will include practicals.

Unit I - 10 Marks, Unit II - 10 Marks, Unit III - 10 Marks,

Unit IV - 10 Marks, Unit V - Practical - 10 Marks.



**NOTE :- The Question paper setter is advised to prepare**

**unit-wise question with the provision of internal choice.**

1. Indian Art, meaning of art, features of indian art, elementary Knowledge of paintings, music, dancing, sculpture archeology, iconography & other social arts.
2. Indian Literature, Ancient Indian Literature, Elementary knowledge of Vedic Literature, Mahabhartta, Ramayan and other main granthas.
3. Indian Freedom Struggle : Freedom Struggle of 1897, National Consciousness, noncooperation movements. Civil disobedient movement quit India movement, contribution of revolutionaries in freedom struggle.
4. Indian Constitution : Introduction, main features of constitution fundamental rights, Fundamental duties.

**Text Book :**

Indian Culture the book sponsored by M.P. Hindi granth Academy is the prescribed text book for the syllabus.

Bridge course for BCA  
(Only For Non Mathematics Students)

MAX MARKS : 50      MIN MARKS : 20

**NOTE :- The Question paper setter is advised to prepare**

**unit-wise question with the provision of internal choice.**

**UNIT - I Algebra**

Partial fractions, Arithmetic Progression & Geometric Progression. Determinants and matrices, Inverse matrix.

**UNIT - II** Permutation combination, method of induction, Binomial Theorem for positive integral index. And any index (with out proof), Exponential and logarithmic series.

**UNIT - III Trigonometry**

Measurement of angles, Trigonometric ratios, simple formula, compound angles, Trigonometric ratios of multiple and sub multiple angles. Hiight and Distance, Inverse Funvtion.

**UNIT - IV Geometry**

Locus, Cartesian coordinate system, Distance formula, Section formula, Slope of a straight line various forms, Angle between two lines, pair of straight lines, parabola, ellipse and hyperbola.

**UNIT - V Statistics**

Frequency Distribution, Measures of central tendency, Mean, Median, Mode, G.M., H.M., Inter Quartile range, Mean deviation, Standard deviation.

**PRACTICAL WORK**  
**BCA - 1**  
**PROGRAMMING IN VISUAL BASIC**

1. Scheme of Examination :- Practical examination will be of 3 hours duration. The distribution of practical marks will be as follows

|                                    |          |           |
|------------------------------------|----------|-----------|
| programme 1                        | -        | 10        |
| programme 2                        | -        | 10        |
| viva                               | -        | 15        |
| [Practical Copy + internal Record] | -        | 15        |
| <b>Total</b>                       | <b>-</b> | <b>50</b> |

2. In every program there should be comment for each coded line or block of code.  
3. Practical file should contain printed programs with name of author, date, path of program.  
4. All the following programs or a similar type of programs should be prepared

**List of Practical.**

1. WAP to perform arithmetic operation **using command buttons, (Declare variables globally).**
2. WAP to take input of principal, rate & time and calculate simple interest & compound interest.
3. Write a program to take input of x and print table of x in the following format.  

$$X * 1 = X$$

$$X * 2 = 2X$$


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$$X * 10 = 10 * X$$
4. Design an interface, which will appear like marksheet. It will take input of marks in five subjects and calculate total marks and percentage then provide grade according to following criteria. (Using nested if) (Use tab index property to move focus).
5. WAP to create a simple calculator **(Using control array)**
6. Write a program to check whether an entered no. is prime or not. **(Using for loop & Exit for)**
7. Write a program which will count all vowels, consonants, digits, special characters and blank spaces in sentences **(Using select case)**
8. WAP to illustrate all functionalities of **listbox** and **combobox**.
9. WAP using check boxes for following font effects.  
 Bold  
 Italic  
 Underline  
 Increase font size  
 Decrease font size  
 Font color
10. WAP for temperature conversion using **option button**.

11. WAP to launch a rocket using **pictures box** and **timer control**.
12. WAP to change back color of any control (label, textbox) using **scroll box**.
13. WAP to search an element for a one **dimension static array**. 14. WAP to sort a dynamic array of
  - (a) n numbers
  - (b) n strings (Input array size at run time)
15. WAP to take input of two matrices and perform their addition, subtraction and multiplication using **menu editor**.
16. WAP to illustrate **call by value and call by reference** (to swap values) to
17. Write a program to calculate factorial of a number using **user defined function**.
18. Take input of a word and WAP to check whether it is a palindrome or not.  
(Without using structure fun)
19. WAP to find smallest among given three numbers using **user defined procedures**.
20. WAP to generate, print and find sum of first n elements of **fivonavvi** series using **recursion**.
21. WAP to perform read write operations in **sequential file**.
22. Create a **user defined data type** having fields name (as string of length 20 bytes), Rollno (as integer), class (as string of 10 bytes). WAP to create a random access file to store above data and perform following operations in this file.
  - (a) Write new record
  - (b) Read / display existing record
  - (c) Delete any record
  - (d) Search any record
  - (e) List selected records
  - (f) Close the file
23. WAP to display records of a table using DAO & bound control code for buttons to move at first record, next record, previous record, lasty record in the table.
24. Create a table using **visual data manager** and write a program using **RDO & advanced bound control** to add, delete, edit & navigate records.
25. WAP to access a database using **ADO** & display a key column in the combo box or list when an item is selected in it, its corresponding records is shown in **MSH flex grid**.
26. Using **Data Environment** create a program to display records of any table.
27. WAP to generate marksheet of students in class through **data report**.
28. WAP to illustrate various **key board and mouse events**.
29. Using **drive, derectory and file list box** (it will show only .bmp files). Let the user select the bmb files, which will appear in picture box as user click on any item in list box.

30. Using **toolbar** design an interface for string manipulation. Toolbar  
 should have tabs to :
- (a) Find length of string
  - (b) No of blank spaces in sting
  - (C) Reverse the string
- Also show current date & time in **status bar**.

**BCA - 1**  
**PROGRAMMING IN 'C'**

1. Scheme of Examination :-  
 Practical examination will be two programs and a project demnstration. It will be of 3 hours duration. All programme with flowchart & algorithms. The distribution of practical marks will be as follows and
 

|                                   |   |            |
|-----------------------------------|---|------------|
| Programme 1                       | - | 20         |
| Programme 2                       | - | 20         |
| Programme 3                       | - | 20         |
| Viva                              | - | 25         |
| [Practical Copy + Internal Record | - | 15         |
| <b>Total</b>                      | - | <b>100</b> |
2. Eomonstration of installation of C programming language.
3. Practical file should contain pronted programs with name of author.  
 date, path of program, unit no. and pronted output.
4. In every program there should be comment for each coded line or  
 block of code
5. All the following programs or a similar type of programs should be  
 prepared
6. The mini - Project could be on Sale or Purchases or Working of a part of  
 a Whole system such as Regulation of interview using queue, Sale of  
 handicrafts with bargain, Sale of story books, Expenses in househokd  
 purchases, Purchase of  
 stationery in office, Phone / Train/ Book Catalogue using binary  
 tree, Sale of ice - cream/snacks/ fast-food/ sweets etc.
7. The format of project report will be as given later.

**List of Practical**

**INPUT AND OUTPUT, FORMATTING**

1. Write a program in which tou declare variable of all data types  
 supported by c language Get input from user and pront the value of  
 each variable with alignment left, right and column width 10. For real  
 numbers pront their values with two digits right to the decimal.

**Loops Decisions**

2. Write program to print all combination of 1 2 3.
3. Write program to generate following pattern
4. Write main function using switch—case, if— else and loops which  
 when called asks pattern type; if user enters 11 then first pattern is generated  
 using for loop. If user enters 12 then first pattern is generated using while  
 loop. If user enters 13 then first pattern is generated using do-While loop.  
 If user enter 21 then a second pattern is generated sung for loop and so on.

5. Write program to display number 1 to 10 in octal, decimal and hexadecimal system.
6. Write program to display number from one number system to another number system. The program must ask for the number system in which you will input integer value then the program must ask the number system in which you will want output of the input number after that you have to input the number specified number system and program will give the output according to number system for output you mentioned.
7. Write a program to perform following tasks using switch—case, loops, and conditional operator (as and when necessary)
  - a) Find factorial of a number.
  - b) Print fibonacci series up to n term and its sum
  - c) Print sin series up to n terms and its sum.
  - d) Print exponential series up to n terms and its sum.
  - e) Print prime numbers up n terms.
  - f) Print whether a given year is leap or not.
8. Write program no. 6 but use library function to perform above tasks.

### **ARRAY**

9. Create a single program to perform following tasks using switch, if—else, loop and single dimension character array without using library function :
  - a) To reverse the string.
  - b) To count the number of characters in string.
  - c) To copy the one string to other string;
  - d) To find whether a given string is palindrome or not.
  - e) To count no. of vowels, consonants in each word of a sentence and no. of punctuation in sentence.
  - f) To arrange the alphabets of string in ascending order.
10. Create a single program to perform following tasks using switch, if— else, loop and single dimension integer array:
  - a) Sort the elements.
  - b) Search for presence of particular value in array element using linear search.
  - c) Search for presence of particular value in array element using binary search.
11. Write a program that read the afternoon day temperature for each day of the month and then report the month average temperature as well as the days on which hottest and coolest days occurred.
12. Create a single program to perform following tasks using switch, if—else, loop and double dimension integer array if size 3x3;
  - a) Addition of two matrix.
  - b) Subtraction of two matrix
  - c) Multiplication of two matrix.
  - d) Inverse of matrix.
  - e) Transpose of matrix

- f) Sum of diagonal elements
13. Create a single program to perform following tasks using switch, if—else, loop and double dimension character array of size 5x 40:
- Sorting of string
  - Finding the largest string
  - Finding the smallest string.
  - Searching for presence of a string in array.

### Functions

14. Write program using the function power (a , b) to calculate the value of a raised to v.
15. Write program to demonstrate difference between static and auto variable.
16. Write program to demonstrate difference between local and global variable.
17. Write a program to perform following tasks using switch— loops and function. case,
- Find factorial of a number
  - Print Fibonacci series up to n terms and its sum.
  - Print Sin series up to n terms and its sum.
  - Print exponential series up to n terms ans its sum.
18. Write a program to perform following tasks using switch— loops ans recursive function. case,
- Find factorial of a number
  - Print Fibonacci series up to n terms and its sum.
  - Print Sin series up to n terms and its sum.
  - Print exonential series up to n terms and its sum
  - Print natural series up to n terms and its sum.
19. Write a function to accept 10 characters and display whether each input character is ditgit, uppercase letter or lower case letter.

### ARRAY & FUNCTION

20. Create a single program to perform following tasks using switch, if—else, loop, function and double dimension integer array of size 3x3:
- Addition of two matrix
  - Subtraction of two matrix.
  - Multiplication of two matrix.
  - Inverse of matrix.
  - Transpose of matrix.
21. Create a single program to perform following tasks using switch, if—else, loop, user defined function and single dimension character array:
- To reverse the string.
  - To count the number of character array:
  - To copy the one string to other string;

- d) To find whether a given string is palindrome or not.  
 e) to count no. of vowels, consonant in each word of a sentence and no. of punctuations in sentence.
22. Create a single program to perform following tasks using switch, if—else, loop, function and single dimension integer array :
- Sort the elements.
  - Find largest element and smallest element.
  - Search for presence of particular value in array element using liner search.
  - Search for presence of particular value in array element using binary search.
23. Create a single program to perform following tasks using switch, if—else, loop, function and double dimension character array of size 5x40:
- Sorting of string
  - Finding the largest string, lexicographically.
  - Finding the smallest string, lexicographically.
  - Searching for presence of string in array.

### STRUCTURE & UNION

24. Create a structure student having data members to store roll number, name of student, name of three subjects, max marks, min marks, obtained marks, Declare a structure variable of student. Provide facilities to input data in data members and display result of student.
25. Create a structure Date with data member's dd, mm, yy (to store date), Create an other structure Employee with data members to hold name of employee, employee id and date of joining (data of joining will be hold by variable of structure Date which appears as data member in Employee structure). Store data of an employee and print the same.
26. Create a structure Student having data members to store roll number, name of student, name of three subjects, max marks, min marks, obtained marks. Declare array of structure to hold data of 3 students. Provide facilities to display result of all students.  
 Provide facility to display result of specific student whose roll number is given.
27. Write program to create structure complex having data members to store real and imaginary part. Provide following facilities:
- Add two complex nos, using structure variables.
  - Subtract two complex nos. using structure variables.
  - Multiply two complex nos. using structure variables.
  - Divide two complex nos. structure variables.
- Use structure as argument to function and function returning structure.

### POINTER

28. Define union Emp having data members :- one integer, one float and one single dimension character array. Declare a union variable in main and test the union variable.
  29. Define an enum Days\_of\_Week members of which will be days of week. Declare an enum variable in main and test it.
  30. Write a program of swapping two numbers and demonstrates call by value and call by reference.
  31. Write program to sort strings using pointer exchange.
  32. Write a program in c using pointer and function to receive a string and a character as argument and return the no. of occurrences of this character in the string.
  33. Create a program having pointer to void to store address of integer variable then print value of integer variable using pointer to void. Perform the same operation for float variable.
  34. Write program to find biggest number among three numbers using pointer and function.
  35. Write program to Create a structure Employee having data members to store name of employee, employee id, salary. Use Pointer to structure to store data of employee and print the stored data-using pointer to structure.
  36. Write program to create a structure Employee having data members to store name of employee, employee id, salary. Use Pointer to structure to simulate dynamic array of structure store data of n employees and print the stored data of n employees using pointer to structure.
  37. Write a program to sort a single dimension array of integers of elements simulated by pointer to integer. Use function for sorting the dynamic array.
  38. Write a program to sum elements of a double dimension array of integers of m rows and n columns simulated by pointer to pointer to integer. Use function for sum the elements of the dynamic array.
  39. Write program to demonstrate difference between character array and pointer to character.
  40. Write program to demonstrate difference between constant pointer and pointer to constant.
  41. Write program to demonstrate pointer arithmetic.
  42. Write program to demonstrate function-returning pointer.
  43. Write program using self-referential pointer to structure to create and print the linked list, data structure.
- FILE STREAMS**
44. Write program to copy content of one file to other file removing extra space between words name of files should come from command line arguments.
  45. Write program to create a file 'data' containing a series of integers and count all even numbers present in the file 'data'.



46. Write a program to count no. of tabs, new lines, character and space of a file.
47. Write a program to read item number, rate and wuanntity from an inventory file and **print the followings** :
  1. Items having quantity > 5
  2. Total cost of inventory.

### BCA - 1

#### INTRODUCTION TO PC SOFTWARE & INTERNET APPLICATION

1. Scheme of Examination :-  
 Practical examination will be of 3 hours duration. The distribution of practical marks will be as follows:-
 

|                                     |          |            |
|-------------------------------------|----------|------------|
| Programme 1 (Word)                  | -        | 13         |
| Programme 2(Powerpoint)             | -        | 13         |
| Programme 1 (Excel)                 | -        | 13         |
| Programme 2 (HTML / Internet Tools) | -        | 16         |
| Viva                                | -        | 25         |
| [Practical Copy + Internal Record]  | -        | 20         |
| <b>Total</b>                        | <b>-</b> | <b>100</b> |
2. In every program there should be comment for each coded line or block of code.
3. Practical file should contain printed programs with name of author, date, path of program, unit no. and printed output.
4. All the following programs or a similar type of programs should be prepared.

#### List of Practical

##### MS-WORD

**File New, Open, Save, Cut, Copy, Paste, Drag Drop, Bullets and Numbering, Undo, Redo, Find, Replace, Paragraph Formatting, Character Formatting and Page Formatting.**

1. Open a document. Type the following text and perform the tasks as instructed below.

Working with Word Processor.

As already mentioned, a word processor is package that processes textual matter and creates organized and flawless documents. In addition to it a word processor not only remote all the limitations of typewriter but also offers various useful features that cannot be even dreamt of with typewriter.

Also if same textual matter is to be reproduced with minor changes, retyping the only option in typewriters.

The word processing (and word processor) originated way back in 1964 when special typewriters. Magnetic Tape Selectric typewriters (MIST) were launched by IBM (International Business Machines).

- (i) Insert the following text arter the first paragraph

The main components of a word processing system are listed below:

- Computer
  - Printer
  - A word processing software
- (ii) Save the document as word 1.doc
- (iii) Move the second paragraph to the end of the document. Using drag & drop.
- (iv) Move the second paragraph in the end of the document using cut, paste operations.
- (v) Undo the above actions.
- (vi) Now use Redo actions.
- (vii) Go to the end of the document (In one step)
- (viii) Go to the Beginning of document (In one step)
- (ix) Insert page break before the third paragraph.
- (X) Search the word "computer: in your document with options Match case, find whole words only.
- (Xi) Replace the word "typewriters" with "word processor"
- (Xii) Undo the above action.
- (Xiii) Remove All page breaks from your document.
- (Xiv) Change the magnification of your document to different percentages using zoom features.
- (XV) Format the above written paragraphs and give the options as follows:
- (1) Alignment justified
  - (2) Indentation : left 0.2 right: 0.2
  - (3) Spacing: before 6 pt, after: 6 pt.
  - (4) Special : first line by : 0.4"
  - (5) Line spacing 1.5 lines.
- (Xvi) Set the default tab stop to 0.3"
- (Xvii) Set the margins to 1.25
- (Xviii) Format the page using
- (1) Left margin:0.5, right margin : 0.5
  - (2) Top margin:1.5, bottom margin:0.5
  - (3) Gutter Margin:1 Indentation: left 0.2 right 0.2
  - (4) Header Margin:0.5
- (Xix) Format the each occurrence of group of words 'Word Processor' as bold, Italic, under line and small caps using find and replace with formatting options.
- (xx) Align the heading to Center and make to bold, underlined and italicized.

## **File New, Open, Save, Find, Replace, Paragraph Formatting, Character Formatting and page formatting.**

2. Type the text as show below and perform the tasks as directed:  
Computers

COMPUTER is an electronic device that processes data and gives meaningful information. computers are veing used in almost all the fields today

EXPERT SYSTEMS

HUMAN THINKING AND ARTIFICIAL INTELLIGENCE

Can computer think ?

All at word Today: Natural Lanuage programs and Expert Ststems.

THE IMPACT OF COMPUTERS ON PEOPLE

The Posive Impact

The Potential Dangers

THE IMPACT OF COMPUTERS ON ORGANIZATIONS

The information Processing Industry

The Potential Dangers for Using Organizations

(i) Search for the word 'Computer' in the entire document.  
All the occurrences of the given word are to be searched irrespective of the case.

(ii) In the above question note that word also searches 'computerization and 'Computerisations'. Now make sure that this time Word searches only for the word 'computer' in the entire document.

(iii) Change the entire uppercase letter to lowercase.

(iv) Give a heading to the above written text

'COMPUTERS IN TODAY'S WORLD'

(v) Centre aligns the Heading text Computer that appears in first line.

(vi) Apply outside vorder to entire document.

(vii) Apply outside border to the just heading text.

(viii) Change page setup according to the following specifications

Top margin: 1.5", Vottom margin:1.5"

Gutter: 1", left margin:1.5"

Right margin:1"

Page width:7.5", page height:6.5 "

Orientation:portrait

(ix) Give a header ' Creations ' and footer ' The school of computing'. The footer should also consist of page no's.

(x) Give appropriate commands for giving different header and footers for first page and odd & even pages.

(xi) Save and close the document.

**Character Formatting, Pagagraph Formatting.**

3. Type and format the text as shown below it any spelling or grammar mistake occurs correct it using spelling and grammar facility.

### DELHI

New Delhi, the capital and the third largest city of india ia a fusion of the ancient and the modern. The remains of the Muslim dynasties with its architectural delights. give the majestic ambience of the bygone era.

On the other side New Delhi, The imperial city built by British, reflects the fast paced present. The most fascinating of all is the character of Delhi which varies from the 13th century mausoleum of the Lodi kings to ultra modem glass skyscrapers.

### **Character Formatting**

4. Type text and Format the text as shown below :

### **Bullets and Numbering**

5. Write text and format as shown below
1. Own house
    - . 2400 square feet living area
    - . Separate bungalow
    - . Car shed available
  2. Car
    - . Maruti Omni Van
    - . Registration number TN 728195
    - . 1994 model

Table

6. Create the following table.  
Admission 2005-06

Table

7. Create Table as Shown

Mail merge, Mailing Labels

8. Write a letter to send invitation to your friend on your birthday.  
9. Create labels of your friends' address.

Formatting and Frames

10. Prepare a letter as shown below.

To,

The Principal  
ABC College, ABC Nagar,  
Raipur (C.G.)

Sub:- Leave.

Respected Sir,

This is to bring to your kind notice, that due to reasons mentioned below, I am unable to attend the college/ I could not attend the college.

-----  
-----

As such, I request you to kindly grant me leave for -----

Thanking you.

Your Faithfully

Raipur :

Signature -----

Dated :

Name -----

Designation -----

Shapes

11. Create Following Figures.

### **Insert Picture and Caption**

12. Type the text as shown below and insert picture any picture you have and place caption. As already mentioned., a word processor is a package that processes textual matter and creates organized and flawiess documents.

In addition to it a word processor not only remote all the limitations of typewriter but also offers various useful features that cannot be even dreamt of with typewriter.

13. Create Columnar Text as shown below

New Delhi, the capital and the third largest city of india is a fusion of the ancient and the modem.

he remains of the Muslim dynasties with its architectural delights, give the majestic ambience of the bygone era. On the other side Now Delhi. The imperial city built by British, reflect sthe fast paced present.

The most fascinating of all is the character of Delhi, which varies from the 13 th century mausoleum of the Lodi kings to ultra modern glass skyscrapers

1. Create the following work sheet and save the worksheet as wages.xls

PACE COMPUTERS (ATC CEDT), GOVT. OF INDIA

Payroll for Employee (Temporary)  
Today's for employee (Temporary)

Today's date            3 - jul -08  
Pay Rate                95

Worker's                days  
Gross  
Name                    Hired On        Worked  
Wages

Kushagra               3 - Mar - 07  
Pradeep                4 - Mar - 07  
Puneet                  5 - Mar - 07  
Rajeev                  6 - Mar - 07

- (i) Calculate days work and gross wages
2. Create the following worksheet and save the worksheet as wages.xls
- (i) Calculate the total salary as sum of Basic salary, HRA, DA, for each employee for 1997
- (ii) Calculate total salary for tear 1998 as sum of salary of 1997 and bonus
- (iii) Calculate % increase in salary from 1997 to 1998
3. Create a worksheet as follows  
Pace computer (ATC CEDT) Govt. Of India  
Payroll for employee (Permanent)

(i) allow bonus 8000 to employee having service >2 year other wise allow bonus 3000

(ii) find net salary as sum of bonus and salary

4. Create the worksheet as follows

- (i) find Total of two subject for each student
- (ii) find average of two subject for each student
- (iii) find class as average of average column
- (iv) find division of student as first, second, third, assume

percentage of division of your own and maximum marks in each student as 100

- (v) Apply conditional formatting for division column, first division should be in bold, second division should be in italic and third division should be underline

5. Create macro in excel to make elected cell, bold, italic bordered and center across select outside

6. Create var chart with given data

|        | 2001 | 2002 | 2003 |
|--------|------|------|------|
| Tea    | 19   | 23   | 25   |
| Coffee | 22   | 24   | 22   |
| Sugar  | 45   | 40   | 45   |

- (ii) Provide heading production detail
- (iii) Provide z axis title; lacks metric tone
- (iv) Provide x axis title year

7. Create a table with column heading as shown below and using form perform data entry of records.

| Zone  | Department | Employee | Salary |
|-------|------------|----------|--------|
| West  | Marketing  | Mukesh   | 10500  |
| East  | Sales      | Rahul    | 20000  |
| South | Marketing  | Suresh   | 5500   |
| North | Marketing  | Anju     | 25000  |
| South | Sales      | Neeraj   | 8000   |
| North | Sales      | Ajay     | 8000   |
| South | Marketing  | Mahesh   | 7500   |
| West  | Sales      | Rajesh   | 4500   |

- (i) Sort the data according to Zone then by Department
- (ii) Use group and outline feature to show & hide details.

8. Create a table with column heading as shown below and using form perform data entry of records.

| Zone  | Department | Employee | Salary |
|-------|------------|----------|--------|
| West  | Marketing  | Mukesh   | 10500  |
| East  | Sales      | Rahul    | 20000  |
| South | Marketing  | Suresh   | 5500   |
| North | Marketing  | Anju     | 25000  |
| South | Sales      | Neeraj   | 8000   |
| North | Sales      | Ajay     | 8000   |
| South | Marketing  | Mahesh   | 7500   |
| West  | Sales      | Rajesh   | 4500   |

- (i) Use filter command to show records having zone : West

- (ii) Use filter command to show records having zone : West and salary less than 5000
- (iii) Use filter command to show records having salary greater than 10000
9. Create pivot table using Data of exercise 8
10. Suppose a database exists in ms - access you are required to import the data. How will you ?
11. Create a table using feature
- |           |      |
|-----------|------|
| Principal | 1500 |
| Rate      | 4%   |
| Time      | 5    |
12. Using goal seek feature find out the interest rate it must be to earn interest 500
- |           |      |
|-----------|------|
| Principle | 1500 |
| Rate      | 4%   |
| Time      | 5    |
| Interest  | 300  |

### MS - POWER POINT

1. Write an animated Presentation about any three courses available in a collage
2. Write an animated Presentation about communication of a bad news.

## BCA-II

### THEORETICAL FOUNDATION OF COMPUTER SCIENCE

#### PAPER - I NUMERICAL ANALYSIS

MAX MARKS : 50

**NOTE :** The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice. Simple/calculator is allowed.

Scientific

**Unit-I SOLUTION OF POLYNOMIAL AND TRANSCENDENTAL ALGEBRIAC EQUATIONS**  
Bisection method, Regula falsi method & Newton's method, Soluton of Cubic & Biquadratic Equation.

**Unit-II SIMULTANEOUS EQUATIONS AND MATRIX**  
Gauss-jordan method, Cholesky's method, Reduction to lower or upper Triangular forms, inversion of matrix, method

of



partitioning, Characteristics equation of matrix, Power methods, Eigen values of matrix, Transformation to diagonal forms.

### **Unit-III INTERPLATION - SINGLE VARIABLE FUNCTIONS**

Newton's Interpolation formula, Newton's Forward and Backward Difference Interpolation Formula, LAN granges Interpolation formula, Newton's Divided Difference Interpolation Formula.

### **Unit-IV NUMERICAL DIFFERENTIATION AND INTEGRATION**

Newton-cotes integration formula, Trapezoidal Rule, Simpson's One-Third and Three Eight Rule, Waddle's Rule.

### **Unit-V NUMERICALS SOLUTION OF ORDINARY DIFFERENTIAL AND INTEGRAL EQUATION**

Numerical Solution of first order Ordinary Differential Equations, one step method. Euler's, Picard's and Taylor's series Methods, Picard's Methods for successive approximations, Runge-Kutta method.

### **BOOKS RECOMMENDED**

1. Garewal : Numerical methods
2. Gupta & Mallic : Numerical Methods
3. Hamming R.W. : Numerical methods for scientist & Engineers.  
(McGraw Hill)
4. Conle S.D. : Elementary numerical analysis Carl De Boor  
(International Book Company London)
5. Jain M.K. : Numerical methods for Science and Engineering  
Lyengar S.R.K Calculations (John Willey & Sons)

### **THEORETICAL FOUNDATION OF COMPUTER SCIENCE PAPER - II : DIFFERENTIATION AND INTERGATION**

**NOTE :- The Question Paper setter is advised to prepare unit-wise question with the provision of Internal choice. Only Simple calculator is allowed not Scientific calculator.**

#### **Differentiation**

**Unit - I** Successive Differentiation, Leibniz's Theorem, Rolle's Theorem, Lagrange's and Cauchy Mean Value Theorem, Taylor's Theorem, Expansion by Taylor's and Maclaurin's series.

**Unit - II** Asymptotes, Curvature, Test of Convexity and Concavity, Point of Inflexion, Tracing of Curves in Cartesian and Par form.

**Unit - III** Partial and Directional Derivatives of functions of two and three variables, jacobian's Theorem.

#### **Integration**

**Unit-IV** Integration of functions by parts, by substitution and by partial fraction; Definite Integral and its properties.

**Unit - V** Integration of functions of two and three variables, Change of order of Integration, Determination of Area and Length.

**Books Recommended**

1. **Differential Calculus - Gorakh Prasad**
2. **Differentiation and Integration - H.K. Pathak**

**THEORETICAL FOUNDATION OF COMPUTER SCIENCE**

**NOTE :-** The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice. Only Simple calculator is allowed not Scientific calculator.

**Unit - I INTRODUCTION**

Introduction, Basic terminology, Elementary data organization, Data structure, Data Structure operation.

**Unit - II CONCEPTS OF ARRAYS, RECORDS AND POINTERS**

Basic Terminology, Linear Array: Sorting : Bubble Sort: Searching: Linear Search, Binary Search, Pointers : Pointer Array; Records: Record Structures.

**UNIT -III LINKED LISTS, STACKS, QUEUES, RECURSION -**

Link lists, Traversing a linked list, searching a linked list; Insertion into a linked list, Deletion from a Linked List, Stacks, Array Representation of Stack; Queues.

**UNIT - IV TREES -**

Types of Trees, Binary Trees, Representing Binary, Traversing Binary tree, Searching and Inserting in Binary Tree, Deleting in Binary tree.

**UNIT - V SORTING AND SEARCHING -**

Sorting, Insertion Sort, Selection Sort, Merging, Merge.

**Books Recommended :**

1. Data Structure - Seymour Lipschutz (Schaum's Series)
2. Data Structure & Program Design - Robert L Kruse, 3rd Ed., Prentice Hall.

**DBMS (Oracle SQL)**

**Max Marks : 100**

**Min. Marks : 40**

**Note :-** The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice. Only Simple calculator is allowed not Scientific calculator.

**UNIT-I OVERVIEW OF DATABASE MANAGEMENT SYSTEM**

Database, Definition of DBMS, Purpose of Database System, Data abstraction, Instances and Schema, Data Independence, Data administration roles, Different Kinds of DBMS users, Data Dictionary, Data base languages-DDL, DML, DCL Data Models- The Relational approach, The Network approach, The Hierarchical approach, DBMS storage structure and access method.

**UNIT - II ENTITY-RELATIONSHIP MODEL :**

Entity - Relationship model as a tool for conceptual design- entities attributes and relationships. ER diagrams; Concept of

keys; Candidate key, primary key, alternate key, foreign key;  
Strong and weak entities, Case studies of ER modeling  
Generalization; specialization and aggregation. Converting an ER  
model into relational Schema.

### **UNIT - III Structured Query Language**

Relational Algebra : Select, Project, cross product different  
types of joins (inner join, outer joins, self join); set operations,  
Simple and complex queries using relational algebra-Integrity  
constraints: Not null, unique, check, primary key, foreign key,.

### **UNIT - IV Relational Database Design -**

Normalization concept in logical model; Pitfalls in database  
design, update anomalies: Functional Dependencies, join  
dependencies, Normal forms (1NF, 2NF, 3NF), Boyce Codd  
Normal form, Decomposition, Multi-Values Dependencies,  
3NF, 5NF.

### **UNIT - V INTRODUCTION TO ORACLE :**

Introduction to Commercial database query language, SQL &  
its environment. SQL as data definition language- creating tables, altering  
tables. drop tables SQL as data manipulation language-Inserting,  
Deleting, Retrieving and updating data in a table, SQL as query language.  
Introduction to SQL constructs (SELECT ...FROM,WHERE... GROUP  
BY... HAVING...ORDERBY.....) Temporary tables, Nested  
queries.

#### **Suggested Books**

1. Data base system : Korth & Siberschatz.
2. Data Base Management System : Alexies & Mathews [Vikas  
publication]
3. An Introduction to Data base System : C.J. Date
4. Data Base Management System : Raguramakrishnan.

### **Programming in C++ & Visual C ++**

**Max Marks : 100**

**Min. Marks : 40**

**Note :- The Question Paper setter is advised to prepare unit-wise  
question with the provision of internal choice. Only Simple  
calculator is allowed not Scientific calculator.**

#### **UNIT- I Overview of Object Oriented Concepts**

Need for Object Oriented programming; Procedural Language;  
The Object Oriented approach; advantages of Object  
Oriented Programming; characterization of Object Oriented  
Languages; Objects; Classes; inheritance; reusability; New data  
types; Polymorphism and overloading.

#### **UNIT-II Object Classes and Inheritance**

Object and Class, Using the class, class construct, class  
destructors, object as function argument, struct and classes, array as  
class member, operator overloading. Type of  
inheritance, Derive class, Base class, Base class, Access specifier;  
protected. Overriding, member function, String.

#### **UNIT-III Object Oriented Programming**

In Overview of C++ Programming; Loops and decision; Structures and function. Arrays and Pointers, Inheritance. Overloaded Function, Inline Function, Virtual Function. Pure virtual Functions Streams.

#### **UNIT - IV Object Oriented Design & Database**

Object structure concepts; Object type; Attribute types; relationship type: Object behavioral concepts; Methodology for Object Oriented Design; Booch methodology Relational Vs Object Oriented Databases. The architecture of Object Oriented Databases.

**UNIT - V Introduction to VC++ - C under windows, Overview of VC++, VC++ workspace & projects, creating source code C++ code to a program.**

file, adding

**Introduction to MFC - The party of VC++ programs, the application object, the main window object, the view object, document object, Windows event oriented programming.**

the what is device context.

#### **Recommended Books :**

1. Object Oriented Programming : Mc Gregor & Sykes SA, 1992 Van Nostrand.
  2. The C++ Programming Language : Strustrp B. Addison Wasley.
  3. Object Oriented Programming in C++ : Lafore R, algotia Puvlications.
  4. Introduction to Object Programming : Witt KV, Galgotia Oriented Publications.
  5. Object Oriented Programming : Blaschek G, Springer Verlag
  6. Object Data Management : Cattel R, Addison Wasley.
  7. Modern Database Systems : Kim W, ACM Press, VC++ Addison Wesley.
1. Visual C++ in Record time: Styeven Holzner
  2. Visual C++ Programming : Yashwant P. Kanetkar

#### **COMPUTER NETWORKING & INTERNET TECHNOLOGY**

**MAX MARKS : 100**

**MIN. MARKS : 40**

**Note :- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice. Only Simple calculator is allowed not Scientific calculator.**

#### **UNIT - I Introduction to Computer Networking -**

Data Communication, Networks - Distributed Processing, Network Criteria, Application; Protocols and Standards, Standard Organization, Line Configuration - Point to Point, Multi Point; Topology-Mesh, Star, Tree, Bus, Ring, Hybrid; Transmission.

#### **UNIT-II The OSI Model -**

The model - Layered architecture, functions of the layers - Physical layer, data link layer, Network layer, Transport layer, session layer, Presentation layer, Application layer: the TCP/IP reference model, comparison of TCP/IP & OSI, ovell Netware, Arpanet, NSFNET.

#### **UNIT-III Transmission of Digital Data -**

Analog and Digital , Digital data transmission - parallel transmission, serial transmission, DTE-DCE interface-data terminal equipment, data circuit terminating equipment, standards, modems - transmission rate, Modem standards.

**UNIT-IV Introduction to Internet Technology** - Architecture of Internet, Client server model, image maps, forms & introduction to CGI Scripting.

**UNIT-V Scripting Language for web design** : - What is Java, Introduction to java applet, Adding applet to web page, Java Script, Structure of Java Script, Basic Commands of Dynamic html. Java Script,

**Cascading Style Sheets & Web Server** - Defining Styles within HTML tags. Features of Style sheet, Web server, Publishing website, Case Studies.

#### **Recommended Books -**

1. Introduction to Data communication & Networking - Behrouz & Forouzan
2. Computer Networking - Andres & Tanenbaum
3. Web Publishing - Monica D'Souza & Jude D'Souza.
4. WWW Designing with HTML - C Xavier

#### **LINUX**

**MAX MARKS :50**

**MIN. MARKS : 20**

**Note :- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice. Only Simple calculator is allowed not Scientific calculator.**

#### **UNIT-I Introduction to Linux**

Introduction to Linux system, History and Emergence, Features of Linux system, Different Linux distributions, Hardware Requirements for the different versions of Linux, Architecture of Linux, Features of the Kernel and Kernel Shell relationship.

Linux File System Features of Linux file system, File types and permissions, Getting started, Logging in/out with the concept of home directory, File operations and links, Commonly used commands like GREP, Find, who, is, pwd, mv, Is, cd, df, cat head, tail, rm, sort, grip, ps, whoami, chmod, chonn, gunzip, date, bc, tar.

#### **UNIT-II Text Processing**

Introduction to Text Processing. Vi editor, vi Features, Vi Commands, Yanking. Running shell commands, from within Vi, Command macros, Set show mode, Set Auto Indent, Set number, Introduction to Exrc file Emacs editor, Emacs feature, Emacs commands, Using cut, paste and copy in Emacs Saving buffer in Emacs.

#### **UNIT-III Shell Programming**

Introduction to Shell & Shell Programming; Features of a Shell, Different types of a Shell, Why use more shell, Shell treatment to the command line, the environment, set, setenv, path, home, ifs, mail, ps1, ps2, term, log name, profile, sty, profile file, login/ logout file, setting environment, simple shell programs, for.....do. case, do while construct.

#### **UNIT - IV X-Windows**

X-Windows: what is X-windows, Microsoft windows verses X-windows, windows manager, FVWM and FVWM95, twm, the client server model of x-windows, starting and stopping an X-window session.

### **GNOME & KDE**

Using the GNOME & KDE desktop environment : starting the GNOME desktop environment, the GNOME panel, using the main system menu, the Gnome file manager, getting help in GNOME, using the Gnome control. A history of KDE project. starting the KDE desktop environment, exploring the KDE desktop, KDE main system menu, using file manager window, setting wallpaper, screen savers in KDE.

### **UNIT - V System Administration of Linux**

Installation & system Administration of Linux : responsibilities of a system administrator, startup and shutdown process, init and profile file importance, security file access permission, user and group related jobs. managing disk space, managing file system, backup and restart process. PRC-installation req uisite, minimum hardware requirement for Red Hat Linux, Hard Disk Partitioning, installation of Red Hat Linux Installation of Printer, Scanner and Peripheral devices in Linux

### **References :**

Mastering Linux : BPB publication  
Complete Reference Linux.

## **B. Principles of Management**

**NOTE : - The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.**

### **UNIT-I MANAGEMENT :**

Concept, Nature and Scope of management. The evolution of Management thought, Approaches of management, New classical school Modern organizational Theories, Behaviourial Approach and Systems Approach, Tasks of a professional Manager, Responsibilities of a Professional Manager, Management Systems and Processes, Managerial Skills.

### **UNIT - II PLANNING**

Significance, Objectives Types of Plans, Strategies & Polices, Proceedings methods & rules Project Management. Planning Evaluation, Feasibility Report, Planning Process Planning under systems approach.

### **UNIT - III ORGANIZING**

Significance, objectives, Major approaches to organizational theory, Organizational Structure and Design, the organizational Process, span of control or Departmentation. Delegation of Authority & Inter Department Coordination, Decentralization, Determinants of effective organizing, staffing, selection, appraisal and development of Managers.

### **UNIT-IV DIRECTING**

Significance and issue in managing human factors. Motivation, nature and significance theories and techniques, Leadership styles and influence process, Leadership challenges.

Managerial Communication, definition & Significance, Types of communication, the process and barriers, Building effective communication system, Supervision nature and function, determination of effective supervision.

#### **UNIT-V CONTROLLING & DECISION MAKING**

Definition and elements, Control Techniques, Coordination and determinants of an effective control system.

Organizational, Context of Decisions, Decision Making Models, Decision Making Techniques and Processes.

#### **Recommended Books :-**

1. Principles of Management by Terry Frankin
2. Essentials of Management by Koontz H.O Dennell; Tata McGraw Hill, New Delhi
3. Management by Stoner J.A.F ; Prentice Hall, New Delhi.

#### **Foundation Course English**

(For BA, B.Sc, B.Com, B.H.Sc, Second Year Students of Chhattisgarh)

#### **Recommended Books :- Madhya Pradesh Hindi Granth Academy**

**By - Dr. M.C. Saxena, Dr. A.K. Khare  
Dr. Jaya Tiwari**

#### **PRACTICAL WORK**

##### **BCA-II**

##### **Shell Programming in Linux/Unix**

#### **Scheme of Examination :-**

1. Practical examination will be of 3 hours duration. The distribution of practical marks. be as follows  
Programme 1 - 10  
Programme 2 - 10  
Viva - 15  
[Practical Copy +  
Internal Record] - 15  
**Total - 50**
2. In every program there should be comment for each coded line or block of code .
3. Practical file should contain printed programs with name of author, date, path of program unit no. and printed output.
4. All the following programs or a similar type of programs should be prepared.

#### **List of Practical**

1. Change your shell environment - path, home, ifs, mail, ps1, ps2, term, log name  
i) at command line  
ii) at shell level  
iii) at login level
2. Change the wallpaper, screensaver in GNOME, KDE
3. Install Linux With following specifications - username, password, partitions for various directories such as / etc.
4. Add a user and password, change the password
5. Add & remove a group
6. Create partitions on your disk.
7. Install and configure (i) printer (ii) Scanner

**Using VI editor do the following exercises**

1. In a file
  - i) replace the words 'has' with 'has not'
  - ii) Locate n<sup>th</sup> character
  - iii) Sort lines 21 to 40
2. In a file copy/cut and paste following text -
  - i) At i<sup>th</sup> line, n lines to j<sup>th</sup> line.
  - ii) Yank a few words
  - iii) Cut and paste n words to j<sup>th</sup> position in lth line.
3. Open two files 'txtfile' and 'new file' and copy/cut 5 lines from txtfile and paste them in new file using vi editor.
4. Open 'txtfile' and copy/cut following and paste to the ' new file'
  - i) j<sup>th</sup> to the last line in it.
5. **Create Macro**
  - i) to paste your name at any position in the file.
  - ii) to map the lsy function key to search for "loop" and copy into the buffer 'a' all text following it up to but not including the string "end".
  - iii) to remove all leading spaces in a file. iv) to save and quit vi editor in out mode.

**Write commands**

- \_\_\_\_\_ i) List all files that match a class. ii) List all files that do not match a class.
- \_\_\_\_\_ iii) Change the file permissions iv) Configure or set characteristics of your terminal. Describe any 3.
- \_\_\_\_\_ v) Display the lines in a file that contain a particular word. vi) Append the contents of two files in a file JABC. vii) Count the number of files in a directory.

**Write shell programs**

- \_\_\_\_\_ i) Display all the users currently logged in detail with column headers.
- \_\_\_\_\_ ii) List all files in current directory and save the list in file ABC. Also save the contents of the files in ABC and display the contents in ABC in sorted order.
- \_\_\_\_\_ iii) Sort the contents of a file ABC and save it in OABC.
- \_\_\_\_\_ iv) Display all the users currently logged in detail with column headers.
- \_\_\_\_\_ v) To save current date & time, number of files & directories in the current directory and contents of all the files to a single file NFL.
- \_\_\_\_\_ vi) To input a number and test whether it is + ve, -ve or zero.
- \_\_\_\_\_ vii) To test whether a filename is a regular file or a directory or of other type.
- \_\_\_\_\_ viii) To list only the directories in current path.
- \_\_\_\_\_ ix) To print the greatest of three numbers.
- \_\_\_\_\_ x) To print 12 terms of Fibonacci series.
- \_\_\_\_\_ xi) To display all user currently logged in & also check a particular user every 30 seconds until the logs in.
- \_\_\_\_\_ xii) To save current date & time, number of files in the current directory and contents of all the files matching a pattern to a single file NPFL.
- \_\_\_\_\_ xiii) To display particular messages depending on the weekday.
- \_\_\_\_\_ xiv) To display common messages for following group of days-Monday & Wednesday Tuesday & Thursday and Friday & Saturday and other day.
- \_\_\_\_\_ xv) To display whether today is exam of BCA-II.
- \_\_\_\_\_ xvi) To wish ' Good Morning' & 'Good Evening'.
- \_\_\_\_\_ xvii) To accept a string form the terminal and echo a suitable message if it doesn't have at least 9 characters.



**BCA - II**  
**DBMS (Oracle, SQL)**

1. Scheme of Examination :-  
Practical Examination will be of 3 hours duration. The distribution of practical marks will be as follows :-

|   |          |            |
|---|----------|------------|
| Programme 1                               | -        | 10         |
| Programme 2                               | -        | 10         |
| Viva(C + proj)                            | -        | 25         |
| [Practical Copy +<br>Practical Sessional] |          | 15         |
| Project Completeness                      |          | 15         |
| Project Report                            | -        | 15         |
| Project Presentation                      |          | 10         |
| <b>Total</b>                              | <b>-</b> | <b>100</b> |

2. In every program there should be comment for each coded line or block of code.  
3. Practical files should contain printed programs with name of author, date, path of no. and printed output. program unit  
4. All the following programs or a similar type of programs should be prepared.

**List of Practical**

Using the following database.

Colleges (Cname, city, address, phone, afdate)  
staffs (sid, sname, saddress, contacts)  
Staff Joins (sid, cname, dept, DOJ, post, salary)  
Teachings (sid, class, paperid, fsession, tsession)  
Subjects (paperid, subject, paperno, papername)

Write SQL statements for the following -

- a. Create the above tables with the given specifications and constraints.  
b. Insert about 10 rows as are appropriate to solve the following queries.  
c. List the names of the teacher teaching computer subjects.  
d. List the names and cities of all staff working in your college.  
e. List the names and cities of all staff working in your college who earn more than 15,000 characters long.  
f. Find the staffs whose names start with 'M' or 'R' and ends with 'A' and/or 7  
g. Find the staffs whose date of joining is 2005.  
h. Modify the database so that staff N1 now works in C2 College.  
i. List the names of subjects, which T1 teaches in this session or all sessions.  
j. Find the classes that T1 do not teach at present session.  
a. Find the colleges who have most number of staffs.  
b. Find the staffs that earn a higher salary who earn greater than average salary of their college. of  
c. Find the colleges whose average salary is more than average salary of a C2  
d. Find the college that has the smallest payroll.  
e. Find the colleges where the total salary is greater than the average salary of all colleges.  
f. List maximum, average, minimum salary of each college.  
a. List the names of the teachers, department teaching in more than one department.  
b. Acquire details of staffs by name in a college or each college.  
c. Find the names of staff that earn more than each staff of C2 College.  
d. Give all principals a 10% rise in salary unless their salary becomes greater than 20,000 in such case give 5% rise. than  
e. Find all staff that do not work in same cities as the colleges they work.  
f. List names of employee in ascending order according to salary who are working in your college or all colleges.  
a. Create a view having fields sname, cname, dept, DOJ, and post.

- b. Create a view consisting of cname, average salary and total salary of all staff in that college.
- c. Select the colleges having highest and lowest average salary using above views.
- d. Select the colleges having highest and lowest average salary using above views.

Enrollment (enrollno, name, gender, DOB, address, phone)

Admission (admno, enrollno, course, yearsem, date, cname)

Colleges (cname, city, address, phone, afdate)

Fee Structure (course, versem, fee)

Payment (billno, admno, amount, pdate, purpose)

- a. Create the above tables with the given specifications and constraints.
- b. Insert about 10 rows as are appropriate to solve the following queries.
- c. Get full detail of all students who took admission this year class wise.
- d. Get detail of students who took admission in Bhilai colleges.
- e. Calculate the total amount of fees collected in this session.
  - i) By your college ii) by each college iii) by all colleges
- a. List the students who have not paid full fee
  - i) in your college ii) in all colleges.
- b. List te number of admissions in your class in every year.
- c. List the students in the session who are not in the colleges in the same city they live in.
  - d. List the students in colleges in your city and also live in your city.

as

Subjects (papered, subject, paper, papername)

Test (papered, date, time, max, min)

Score (rollno, papered, marks, attendance)

students (admno, rollno, class, yearsem)

- a. Create the above tables with the given specifications and constraints.
  - b. Insert about 10 rows as are appropriate to solve the following queries.
  - c. List the students who were present in a paper of a subject.
  - d. List all roll numbers who have passed in first division.
  - e. List all students in BCA-II shored have scored higher than average.
    - i) in your college ii) in every college
  - f. List the highest score, average and minimum score in BCA-II
    - i) in your college ii) in every college
1. Using the following database  
 Colleges (cname, city, address, phone, afdate)  
 Staffs (sid, sname, saddress, contacts)  
 Staff Joins (sid, cname, dept, DOJ, post, salary)  
 Teachings (sid, class, paperid, fsession, tsession)  
 Subjects (paperid, subject, paperno, papername)  
 Write SQL statements for the following -
    - a. Create the above tables with the given specifications and constraints.
    - b. Insert about 10 rows as are appropriate to solve the following queries.
    - c. List the names of the teachers teaching computer subjects.
    - d. List the names and cities of all staff working in your college.
    - e. List the names and cities of all staff working in your college who earn more than 15,000
  2. Using the following database  
 Colleges (cname, city, address, phone, afdate)  
 Staffs (sid, sname, saddress, contacts)  
 Staff Joins(sid, cname, dept, DOJ, post, salary)  
 Teachings (sid, class, paperid, fsession, tsession)  
 Subjects (paperid, subject, paperno, papername)
  3. Using the following database  
 Colleges (cname, city, address, phone, afdate)  
 Staffs (sid, sname, saddress, contacts)  
 Staff Joins(sid, cname, dept, DOJ, post, salary)  
 Teachings (sid, class, paperid, fsession, tsession)  
 Subjects (paperid, subject, paperno, papername)  
 Find the classes that T1 do not teach at present session.
    1. Find the college who have most number of staffs.
    2. Find the staffs who earn a higher salary who earn greater than average salary of their college.

3. Find the colleges whose average salary is more than average salary of C2
  4. Find the college that has the smallest payroll.
  5. Find the colleges where the total salary is greater than the average salary of all colleges.
  6. List maximum, average, minimum salary of each college.
4. Using the following database  
Using the following database  
Colleges (cname, city, address, phone, afdate)  
Staffs (sid, sname, saddress, contacts)  
Staff Joins(sid, cname, dept, DOJ, post, salary)  
Teachings (sid, class, paperid, fsession, tsession)  
Subjects (paperid, subject, paperno, papername)
- Find the classes that T1 do not teach at present session.
3. List the names of the teachers, departments teaching in more than one departments.
  4. Acquire details of staffs by name in a college of each college.
  5. Find the names of staff who earn more than each staff of C2 college.
  6. Give all principals a 10% rise in salary unless their salary becomes greater than 20,000 in such case give 5% rise.
  7. Find all staff who do not work in same cities as the colleges they work.
  8. List names of employment in ascending order according to salary who are working in all colleges. your college or
5. Using the following database  
Colleges (cname, city, address, phone, afdate)  
Staffs (sid, sname, saddress, contacts)  
Staff Joins(sid, cname, dept, DOJ, post, salary)  
Teachings (sid, class, paperid, fsession, tsession)  
Subjects (paperid, subject, paperno, papername)
- Find the classes that T1 do not teach at present session.
- e. Create a view having fields sname, cname, dept, DOJ, and post
  - f. Create a view consisting of cname, average salary and total salary of all staff in that college.
  - g. Select the colleges having highest and lowest average salary using above views.
  - h. List the staff names of department using above view.
6. Enrollment (enrollno, name, gender, DOB, address, phone)  
Admission (admno, enrollno, course, yearsem, date, cname)  
Colleges (cname, city, address, phone, afdate)  
Fee Structure (Course, yearsem, fee)  
Payment (Billno, admno, amount, pdate, purpose)
1. Create the above tables with the given specifications and constraints.
  2. Insert about 10 rows as are appropriate to solve the following queries.
  3. Get full detail of all students who took admission this year class wise
  4. Get detail of students who took admission in Bhilai colleges.
  5. Calculate the total amount of fees collected in this session
    - i) by your college ii) by each college iii) by all colleges
7. Enrollment (enrollno, name, gender, DOB, address, phone)  
Admission (admno, enrollno, course, yearsem, date, cname)  
Fee Structure (course, yearsem, fee)  
Payment (billno, admno, amount, pdate, purpose)  
List the students who have not paid full fee  
i) in your college ii) in all colleges  
List the number of admissions in your class in every year.
- List the students in the session who are not in the colleges in the same city as they live in.
- List the students in colleges in your city and also live in your city.
8. Subjects (Paperid, subject, paper, papername)  
Test (paperid, date, time, max, min)  
Score (rollno, paperid, marks, attendance)  
Students (admno, rollno, class, yearsem)
- (5) Create the above tables with the given specifications and constraints.
  - (6) Insert about 10 rows as are appropriate to solve the following queries.
  - (7) List the students who were present in a paper of a subject.
  - (8) List all roll numbers who have passed in first division.

- (9) List all students in MCA-II who have scored higher than average  
 (10) List the highest score, average and minimum score in MCA-II  
 i) in your college ii) in every college

**Note :-** Demonstration of Compiler IDE features like debugging, compiling, and working with project option must be given to students.

The Project should be done by individual student. Format of the student project report on completion of the project. ents

- Cover page as per format
- Certificate of Approval
- Certificate of project guide/center Manager
- Certificate of the company/ Organization
- Certificate of Evaluation
- Declaration. Self Certificate
- Acknowledgement

In the “Acknowledgement” page, the writer recognizes his/her indebtedness for guidance and assistance of the thesis/report adviser and other members of the faculty Courtesy demands that he/she also recognize specific contributions by other persons or institutions such as libraries and research foundations. Acknowledgements should be expresses simply, tastefully, and tactfully.

- Main Report
  - Contents
  - Objectives & Scope of the project
  - Definition of problem
  - System Analysis
  - Details of Hardware and Software used
  - System Design
    - Database design
    - Decision tree/decision table
    - Data flow diagram
    - E-R Diagram
    - Procedural design - Algorithms
    - User interface design
  - Reports Generated
  - Conclusion
  - Bibliography
  - Soft copy of the project on CD/Floppy.

**Formats of various certificates and formatting styles are as :**

**Project report Cover Format :**

**A**  
**Project Report**  
**on**  
**Title of the Project Report**  
**(Times New Roman, Italic, Font Size=24)**  
 Submitted in partial fulfillment of the requirements for the award of degree  
**Bachelor of Computer Application**  
 From  
 Surguja University, Ambikapur, (C.G.).  
 Year : xxx  
 Logo of College

Guide  
 (Guide Name)

Submitted by:  
 (Student's Name)  
 Roll No:  
 Submitted to  
 (College Name)  
 Surguja University, Ambikapur, (C.G.)

**2. Certificate of Approval by Head of the Department/Principal in letter head**

**CERTIFICATE OF APPROVAL**

This is to certify that the Project work entitled”.....” is carried out by Mr/Ms/Mrs....., a student of BCA-III year at (College Name) is hereby approved as credible work in the discipline of Computer Science & Information Technology for the awarde of degree of Bachelor of Computer Application during the year.....from Surguja University, Ambikapur, (C.G.).

(Head/Principal Name)

1. Certificate from the Guide in letter head

**CERTIFICATE**

This is to certify that the Project work entitled “ \_\_\_\_\_ ” Submitted to the (College Name) by Mr/Ms/Mrs \_\_\_\_\_ Roll No \_\_\_\_\_ in partial fulfillment for the requirements relating to nature and standard of the award of **Bachelor of Computer Application** degree by, **Surguja University, Ambikapur, (C.G.)** for the academic year 20\_\_\_\_ - 20 \_\_\_\_

This project work has been carried out under my guidance.

(Guide Name)

2. Certificate of the Company or Organization From Where the Project is done from the \_\_\_\_\_ Project Manager or Project guide.
3. Certificate of evaluation in the department letter head.

**CERTIFICATE OF EVALUATION**

This to certify that the project report entitled “ \_\_\_\_\_ ”. is carried out by Mr/Ms/Mrs \_\_\_\_\_, a student of BCA-III year at (College Name), after proper evaluation and examination, is hereby approved as credible work in the discipline of Computer Science & Information Technology and is done in a satisfactory manner for its acceptance as requisite for the award of degree of Bachelor of Computer Application during the year \_\_\_\_\_ from Surguja University, Ambikapur, (C.G.).

**Internal Examiner**

**External Examiner**

4. Declaration of Student/Self Certificate

**DECLARATION**

This to certify that the project report entitled “ \_\_\_\_\_ ”, Which is submitted by me in the partial fulfillment for the award of the degree of Bachelor of Computer Application, (College Name), Comprises the original work carried out by me.

I further declare that the work reported in this project has not been submitted and will not be submitted, either in part or in full for the award of any other degree or diploma in this Institute or any other Institute or University.

Place : \_\_\_\_\_ (Name)  
Date : \_\_\_\_\_ (Roll No.)

**PRACTICAL WORK BCA-II  
Programming in C++ & Visual C++**

1. Scheme of Examination :-  
Practical examination will be of 3 hours duration. The distribution of practical marks will be as follows

|                                    |   |            |
|------------------------------------|---|------------|
| Programme 1                        | - | 20         |
| Programme 2                        | - | 20         |
| Visual C++                         | - | 10         |
| Viva                               | - | 25         |
| [Practical Copy + Internal Record] | - | 25         |
| <b>Total</b>                       | - | <b>100</b> |

2. In every program there should be comment for each coded line or block of code .
3. Practical file should contain printed programs with name of author, date, path of program unit no. and printed output.
4. All the following programs or a similar type of programs should be prepared.

**List of Practical**

Loops, Decisions, Nested Method, Member Function Defined Outside Class Body

1. Write Program to generate following pattern

a) A B C D E F G  
A B C E F G  
A B F G  
A G

c) \*  
\* \*  
\* \* \*

b) 1  
1 2 3  
1 2 3 4

1 2 1

d) 1  
1 3 3 1  
1 4 6 4 1

1 2

2. Write member functions which when called asks pattern type; if user enters 11 then a member function is called which generates first pattern using for loop. If user enters 12 then a member function is called which generates first pattern using while loop. If user enters 13 then a member function is called which generates first pattern using do-while loop. If user enters 21 then a member function is called which generates second pattern using for loop and so on.
3. Write program to display number 1 to 10 in octal, decimal and hexa-decimal system.
4. Write program to display number from one number system to another number system.  
The Program must ask for the number system in which you will want, output of the input number after that you have to input the number in specified number system and program will give the output according to number system for output you mentioned earlier.

#### Array

5. Write a program using function to add, subtract and multiply two matrices of order 3x3 you have to create one function for addition, which accepts three array arguments. First two array arguments are matrices to add and third matrix is destination where the resultant of addition of first two matrices is stored. In similar way create functions for matrix subtraction and multiplication.
6. Create a single program to perform following tasks without using library function :
  - a) To reverse the string accepted as argument.
  - b) To count the number of character in string passed as argument in form of character array.
  - c) To copy the one string to other string : passes as arguments in form of source character array and destination character array without using library function.
  - d) To count no. of vowels, consonants in each word of sentence passed as argument in form of character array.

#### Class, Object, Array of object, Object Using Array

7. Create a class Student having data members to store roll number, name of student, name of three subjects, max marks, min marks, obtained marks, Declare an object of class student. Provide facilities to input data in data members and display result of student.
8. Create a class Student having data members to store roll number, name of student, name of three subjects, max marks, min marks, min marks, obtained marks. Declare array of object to hold data of 3 students. Provide facilities to display result of all students. Provide also facility to display result of specific student whose roll number is given.
9. Create a class Sarray having an array of integers having 5 elements as data member

#### provide following facilities :

- a) Constructor to get number in array elements. b) Sort the elements. c) Find largest element d) Search for presence of particular value in array element.

#### Static member function

10. Create a class Simple with static member function for following tasks :
  - a) To find factorial by recursive member function .
  - b) To check whether a no. is prime or not.
  - c) To generate Fibonacci series up to requested terms.

#### Object as argument to function, function returning object

11. Write program - using class having class name Darray. Darray has pointer or pointer to integer as data member to implement double dimension dynamic array and provide following facilities :
  - a) Constructor to input values in array elements.
  - b) Input member function to get input in array element
  - c) Output member function to print element value
  - d) Add member function to perform matrix addition using objects.
  - e) Subtract member function to perform matrix subtraction using objects.
  - f) Multiply member function to perform matrix multiplication using objects
12. Write program to create class complex having data members to store real and imaginary part. Provide following facilities:
  - a) Add two complex no. using objects.
  - b) Subtract two complexes no. using objects.
  - c) Multiply two complexes no. using objects.
  - d) Divide two complex no. using objects.

#### Friend Function

13. Create class Polar having data members radius and angle. It contains member function for taking input in data members and member function for displaying value of data members Class Polar contains declaration of friend function add which accepts two objects of class Polar and returns object of class Polar after addition. Test the class using main function and objects of class Polar.
14. Write program to create class distance having data members feet and inch (A single object will store distance in form such as 5 feet 3 inch). It contains member functions for taking Distance contains declaration of friend function add which accepts two objects of class Distance and returns object of class

Distance after addition. Class Distance contains and returns object of class Distance after subtraction. Test the class using main function and objects of class Distance.

15. Write a program to create class Mother having data member to store salary of Mother create another class Father having data member to store salary of Father. Write a friend function, which accepts objects of class Mother, and Father and prints Sum of Salary of Mother and Father objects.

Friend Class

16. Write a program to create class Mother having data member to store salary of Mother create another class Father having data member to store salary of Father. Declare class Fater to be friend class of Mother. Write a member function in Father. which accepts object of class Mother and prints Sum of Salary of Mother and Father Objects. Create Member function in each class to get input in data member and to display the value of data member.

Static Data Member

17. Create a class Counter having a static data member, which keeps track of no. of objects created of type Counter. One static member function must be created to increase value of static data member as the object is created. One Static data member Use main function to test the class Counter.

### STRUCTURE AND CLASS

18. Define structure student. Structure student has data members for storing name, roll no. name of three subjects and marks. Write member function to store and print data.

### COPY CONSTRUCTOR, CONSTRUCTOR OBERLOADING, THIS POINTER, CONSTRUCTOR WITH DEFAULT ARGUMENT.

19. Write program to create a class Polar which has data member radius and angle, define overloaded constructor to initialize object and copy constructor to initialize one object by another existing object keep name of parameter of parameterized constructor same as data members. Test function of the program in main function.

20. Write program to create a class Polar which has data member radius and angle, use constructor with default arguments to avoid constructor overloading and copy constructor to initialize one object by another existing object keep name of parameter of parameterized constructor same as data member. Test functioning of the program in main function

### FUNCTION OVERLOAD, REFERENCE VARIABLE, PARAMETER PASSING BT ADDRESS, STATIC FUNCTION

21. Write a class having name Calculate that uses static overloaded function to calculate area of circle, area of rectangle and area of triangle.

22. Write a class Array Sort that uses static overloaded function to sort an array of floats, an array of integers.

23. Write a program using class, s\which uses static overloaded function to swap two integers, two floats methods use reference variable.

24. Write a program using class, which uses static overloaded function to swap two integer; two floats methods use parameter passing by address.

### STRING, PIINTER, AND OPERATOR OVERLOADING

25. Create class String having pointer to character as data member and provide following Facilities :

- Constructor for initialization and memory allocation.
- Destructor for memory release.
- Overloaded Operators + to add two string object.
- Overloaded Operator = to assign one string object to other string object.
- Overloaded Operator == to compare whether the two string objects are equal or not.
- Overloaded Operator < to compare whether first – string object is less than second string object or not.
- Overloaded Operator > to compare whether first-string object is greater than second string object or not.
- Overloaded Operator <= to compare whether first string object is less than second string object or not.
- Overloaded Operator >= to compare whether first string object is grater than second string object.
- Overloaded Operator != to compare whether first string object is not equal to second string object or not.
- Overloaded insertion and extraction operators for input in data member and display out put of data members.

26. Create a class Matrix having data member double dimension array of floats of size 3x3 Provide following facilities.

- Overloaded extraction Operator for data input.
- Overloaded insertion Operator for data output.
- Overloaded + for adding two matrix using objects.
- Overloaded Operator – for subtracting two using matrix objects.

- e) Overloaded Operator \* for multiplying two using matrix objects.

#### **OPERATOR OBERLOADING WITH FRIEND FUNCTION**

27. Create a class polar having radius and angle as data members, Provide following facilities.
- a) Overloaded insertion and extraction Operators for data input and display.
  - b) Overloaded constructor for initialization of data members.
  - c) Overloaded Operator + to add two polar co-ordinates using objects of class Polar.
28. Create class Degree Celsius having a single data member to hold value of temperature in degree Celsius, Provide following facilities :
- a) Overloaded Operator ++which will increase value of data member by 1 (consider postfix and prefix operator overloading).
  - b) Overloaded Operator – Which will decrease value of data member by 1 (consider postfix and prefix operator overloading).
  - c) Overloaded insertion and extraction operators for input in data member and display value of data member.

#### **OPERATOR OVERLOADING AND DATA TYPE CONVERSION**

29. Create a class Polar that contains data member radius and angle. Create another class Cartesian in the same program and provide following facilities:
- a) It should be possible to assign object of polar class to object of Cartesian class.
  - b) It should be possible to assign object of Cartesian class to object of polar class.
30. Create a class Fahrenheit that contains a data member to hold temperature in Fahrenheit. Create another class Celsius that contains a data member to hold temperature in Degree Celsius; in the same program and provide following facilities :
- a) It should be possible to assign object of Fahrenheit class to object of Celsius class.
  - b) It should be possible to assign object of Celsius class to object of Fahrenheit class.
  - c) It should be possible to compare objects of class Fahrenheit and Celsius to find out which object contains higher temperature.

#### **VOID POINTER, POINTER AND POINTER TO OBJECT**

31. Create a program having pointer to void to store address of integer variable then print value of integer variable using pointer to void. Perform the same operation for float variable.
32. Write program to find biggest number among three numbers using pointer and function.
33. Write swapping program to demonstrate call by value, call by address and call by reference in single program.
34. Write program to Create a class Employee having data members to store name of employee, employee id, salary. Provide member function for data input, output. Use Pointer to object to simulate array of object to store information of 3 employees and test the program in function main.

#### **INLINE FINCTION**

35. Write a program using inline function to calculate area or circle.
36. Write a program using inline function to find minimum of two functions. The inline function should take two arguments and should return the minimum value.

#### **FUNCTION TEMPLATE**

36. Write a program using function template to sort and array of floats, an array of integers.
37. Write a program using function template to swap two integers. Two floats methods use reference variable.

#### **TEMPLATE CLASS**

38. Write a program using class template to simulate stacks of integer and stacks of float.
39. Write a program using class template to simulate linked-list of integer and linked list of floats.

#### **INHERITANCE**

40. Create a class account that stores customer name, account number and type of account. From this derive the classes cur\_acct and sav\_acct to make them more specific to their requirements. Include necessary member functions in order to achieve the following tasks.
- a) Accept deposit from customer.
  - b) Display the balance
  - c) Computer and deposit interest.
  - d) Permit withdrawal and update the balance.
  - e) Check for the minimum balance, impose penalty, necessary and update the balance.
41. Create a class circle with data member radius; provide member function to calculate area. Derive a class sphere from class sphere with additional data member for height and member function to calculate volume.
42. Consider an example of declaring the examination result. Design three classes:- student, exam and result. The student class has data members such as that representing roll number, name of student. Create the class exam, which contains data members representing name of subject, minimum marks, maximum marks, obtained marks for three subjects. Derive class result from both student and exam classes. Test the result class in main function.

#### **VIRTUAL AND PURE VIRTUAL FUNCTION**

- 43 Create a base class shape having two data members with two-member function get data (pure virtual function) and print area (not pure virtual function). Derive classes triangle and rectangle from class shape and redefine member



function print area in both classes triangle and rectangle and test the functioning of classes using pointer to base class objects and normal objects.

#### FILE STREAMS

44. Write program to copy content of one file to other file removing extra space between words name of file should come from command line arguments.
45. Write program – using class and object i/o to store data about Books (Book Id, Book Title, Author, Price, Edition). Provide following facilities :
  - a) Addition of books.
  - b) Searching for availability of books if provided author.
  - c) Deletion of book information.
  - d) Updating on Title, Author, Price, Edition.

#### Visual C++

46. Write program for obtaining Fibonacci series in workspace environment.
47. Write program for multiple inheritance in CV++ Inheritance using book example having different class book, Journals, Magazines, Newspaper.
48. Implement virtual function in VC++ inheritance.
49. Implement friend function in VC++
50. Write a simple program for event handling in VC++ environment.
51. Write a program in VC++ using MFC.

### BCA -III

#### CALCULUS & GEOMETRY

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#### Geometry

**UNIT-IV** Equation to cone with given base, Generators of Cone, condition for three mutually perpendicular generators, Right Circular Cone, Equation of a cylinder.

**UNIT-V** Polar Coordinates, Polar equation to straight line, Circle. Polar equation of a Conic.

#### REFERENCE :

1. Calculus of two and more variables : G.S. Pandey & V.P Saxena (Wiley Eastern)
2. Higher calculus : P.L. Sharma
3. Vector Calculus & Geometry : B.R. Thakur.

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**Max Marks : 50**

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**UNIT-II** Geometric representation, Family of curves and orthogonal trajectories. Linear differential equation with constant coefficients, Operational rules of D. Homogeneous linear equations..

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**UNIT-V** Convergence of Fourier Series, Gibbs Phenomenon, Operations on Fourier Series. Applications of Fourier Series to Differential Equation

#### REFERENCE :

1. Introductory course in differential equations : D.A. Murray
2. Differential equations (Awkl Sameekaran) : B.P. Parashar & L.P. Rajpal
3. Differential equations and Fourier Series : H.K. Pathak

### Computer System Architecture

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|-----------------|--|
| <b>UNIT-I</b>   | Data Representation-Data Types, Number System, Fixed Point Representation 1's, 2's complements, Binary Fixed point representation, Arithmetic operation on Binary operation, Overflow & Underflow, Codes, ASCII, EBCDIC codes, Grey codes, Excess – 3, BCD codes, Error detection & correcting codes.  |
| <b>UNIT-II</b>  | Digital Logic Circuits-Logic Gats AND, OR,NOT Gates & their truth tables, NOR, NAND & XOR Gates, Boolean algebra, Basic Boolean Law, Doorman's theorem, Map Simplification, Minimizing technique, K Map, Sum of product, Product of sums, Combinational & sequential Circuits Half adder & Full adder, Full Sub tractor, Flip Flop – RS, D, JK & T Flip Flop, Shift register, RAM & ROM. |
| <b>UNIT-III</b> | CPU organization, ALU & Control circuit, Idea about arithmetic circuits, Program control, Instruction sequencing. Introduction to Microprocessor, Microprocessor architecture, System buses, Registers Program counter, Block diagram of a Macro computer system, Microprocessor control signals, Interfacing Devices Introduction to Motherboard, SMPS                                  |
| <b>UNIT-IV</b>  | Input output organization, I/O Interface, Properties of simple I/O devices and their Controller, Isolated versus Memory mapped I/O, Modes of Data transfer, Synchronous & Asynchronous Data Transfer, Handshaking, Asynchronous serial transfer, I/O processor.  |
| <b>UNIT-V</b>   | Auxiliary memory-Magnetic drum, Disk & Tape, Semi conductor memories, Memory Hierarchy, Associative memory, Virtual memory address space & memory space, Address mapping, Page table, Page replacement, cache memory, Hit ratio, Mapping Techniques, Writing into cache.   |

**REFERENCE :**

1. Computer System architecture – M. Moris Mano

**Progrrmming In Java**

**Max Marks :100**

**Min Marks : 40**

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**UNIT-I**

**Introduction :**

Genesis of Java, importance to the Internet, overview of features.

OOP:

OOP features, data types, control structures, arrays, methods and classes, nested & inner classes, string and String Buffer class, Wrapper Class, vectors.

**COMPUTER OPERATING SYSTEMS**

**Max Marks - 100**

**Min Marks - 40**

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**UNIT-I**

**Introduction**

What is operating system, basic, concept, terminology, batch processing, spooling, multiprogramming, time sharing real time systems, protection, multiprocessor system, operating system as resource manager, process view point, memory management, process management, device management and information management, other views of operating system, historical, functional job control language and supervisor service control.

**UNIT-II**

**Processor Management (CPU Scheduling)**

Reviewing of multiprogramming oncept, scheduling concept, basic concept, CPU I/O burst cycle process state, PCB (Programme Control Block) scheduling ueries, schedulars, scheduling algorithms – performance criteria, first-come-first served shortest job-first priority, preemptive algorithm, round robin, multilevel queues and multilevel feedback queues, algorithm evolution, multiprocessor scheduling, separate system, coordinated job, scheduling, master/ slave scheduling.

**UNIT-III**

**Memory Management**

Preliminaries of memory management, memory handling in M/C, relocation, swapping and swap time calculation, multiple partitions, partitioned allocation MFT, fragmentation, MVT, compaction, paging, job scheduling implementation of page tables, shared page, virtual memory overlays, concepts of virtual memory demand page, memory management and performance, page replacement and page replacement algorithms, Allocation algorithms, Storage hierarchy disk and drum scheduling – physical charac4teristics fcfs scheduling SCAN, short of seek time first disk scheduling algorithms sector queuing.

**UNIT-IV**

**Information Management (File System)**

File concept, file type, type based system, disk based system, general model of file system. File directory maintenance, symbolic file system, basic file system, physical file system, file support device directory, access methods free space management contiguous, linked allocation and indeed allocation performances.

**UNIT-V**

**Dead Locks**

The Dead Lock problem – Dead Lock definition, Dead Lock detection, detection algorithm usage, Dead Lock characterization, resource allocation graph, Dead Lock prevention,

mutual exclusion, hold and wait, no preemption and circular wait, dead lock avoidance  
 – bankers algorithm, Recovery from Dead Lock process termination, resource  
 preemption, combined approach to Dead Lock handling.

**BOOKS RE COMMENDED :**

1. Principles of Operating System - Peterson.
2. Operating System - Mandinick & Donovan.

**BCA -III  
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OOP features, data types, control structures, arrays, methods and classes, nested & inner classes, string and String Buffer class, Wrapper Class, vectors.
- UNIT-II** **Inheritance :**  
Basics type, method Override, using abstract and final classes, using super,  
**Packages and Interfaces :**  
Defined CLASSPATH, importing packages, implementing interface.
- UNIT-III** **Exception Handling :**  
**Fundamental :** exception types, using try and catch, throwing exceptions, defined exceptions.  
**Multithreaded Programming :**  
Java spread model, Creating threads, and thread priorities, synchronization Suspending resuming and stopping threads.
- UNIT-IV** **Input/Output :**  
Basic Streams, Byte and Character Stream, predefined streams, reading and writing from console and files, Using standard Java Packages (lang, util io)  
**Networking :** Nsecs. TCP/IP client & server sockets, URL connection.  
JDB : Setting the JDNC connectivity with backend database.
- UNIT-V** **Applets :**  
Fundamentals, life cycle, overriding update, HTML APPLET tag, passing parameters  
Developing single applets.  
Introduction to AWT :  
Window fundamentals, creating windowed, programs waking with graphics, using AWT controls, menus. Delegation event model, handling mouse and keyboard events.

**BOOKS RECOMMENDED :**

1. Java complete reference - by Patrick naughten & Mesut Scpddt. (TMH)
2. Java Primer - by E. Balaguruswami
3. Java Programming - Khalid Mughal

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