Syllabus
of

Bachelor of Science

(Computer Science)
Optional Subject

(Three Years Degree Course)

B.Sc. I (Computer Science)
Semester I
PAPER I: INFORMATION AND COMMUNICATION TECHNOLOGY

UNIT-I: Introduction to IT and Computers

Block Diagram of Computer, Functioning of Computer, Generations of Computer, Classification of Computers, Characteristics, Advantages & Limitations of Computer. Computer Memory: Primary & Secondary, Types of Primary Memory

Number System: Decimal, Binary, Octal, Hexadecimal number systems, features andconversions, ASCII & EBCDIC codes.

UNIT-II: I/O and Storage Device

Input devices: Keyboard **Locator Device:** Mouse, Joy Stick Digitizing Tablet **Pick Device:**

Light Pen, Touch Screen Track ball **Voice Recognition:** Microphone, Scanning: MICR, OCR, OMR, Barcode Reader, **Vision Capturing:** Webcam, Digital Camera, Touch Pad **Output devices:** VDU, Dot Matrix, Laser and Inkjet Printers, Plotters.
Storage Devices: Hard Disk, Optical Disk, Blue Ray Disc and Pen Drive

UNIT-III: Windows

Operating System, Classification of Operating System on the basic of task (Single User Single Task, Single User Multiple Task, Multi-User Multiple Task), Features of Windows, GUI, Operating with Windows, Desktop, Taskbar, Windows Explorer, Control Panel, My Computer, My Documents, Recycle Bin

Windows Accessories: Calculator, Notepad, Paint, System Information, Disk Management,Disk Defragmentation, Disk Cleanup

UNIT–IV: Network & Internet

Computer Communication, Need for Networks, Communication Device, Types of Network-LAN, WAN, MAN, Concept of Network Topology, Types of Topologies and its Advantages and Limitations. OSI Model.

Internet: Basic Internet terms, Internet Addressing, Services provided by Internet, Detailabout E-mail, Search Engine, Basic of Intranet. Social and Ethical Issue

Open Source Terminologies: Open Source Software, Freeware, Shareware, ProprietarySoftware

Books:
1) Peter Nortorn's, " Introduction to Computer", TMH, 2004, ISBN-0-07-05-3142-0
2) Pradeep K. Sinha and Priti Sinha " Computer Fundamentals", BPB, 2007, ISBN-10:81-7656-752-3/13:978-81-7656-752-7
3) Chetan Shrivastava " Fundamentals of Information Technology", Kalyani publishers, 2002, ISBN-81-7663-576-6
4) Dr Madhulika Jain,"Information Technology Concept", BPB,2006,ISBN – 81-7656-276-9
5) Verma,"Computer, Internet & Multimedia – Dictionary", Universities Press

References:
1) Sanjay Saxena and Prabhpreet Chopra, " IT Tools and Applications",2008
2) Akshay Kumar, " Information Technology and Info Guide", Authors press,2000, ISBN-81-7273-040-3

B.Sc. I (Computer Science)
Semester I
PAPER II: PROGRAMMING LOGIC AND TECHNIQUES

UNIT-I: Language Evolution
Machine Language, Assembly Language, High Level Language. Translators: Compiler, Interpreter and Assembler. The Compilation Process, Linker, Loader, Study of Programming Languages (Function Oriented, Object Based, Event Base), Study of HLL, Characteristics of Good Language, Generation of Languages,

UNIT-II: Programming Construction Tools

Problem Analysis, Process Analysis, Conceptual Development of Solution. Development Tools: Algorithm: Types of Algorithm, Algorithm of Analysis, Advantage and Disadvantage of Algorithm, Complexity of Algorithm, Big-O Notation Flowcharts: Types of Flowcharts, Adva**ntag**e and Disadvantage of Flowchart. Pseudo Code: Definition and Its Characteristics.

UNIT-III: Control Statements

Basics of Programming Language: Usage of Character Set, Meaning of Keywords andIdentifiers, Role of Data Types, Constants and Variables. Importance of Casting, Different Types of Operators and their Precedence, Expressions, Conditional Statements (One-Way, Two-Way and Multi-Way Conditional), Looping Statements (For, While, do-while), Usage of Exit, Continue, Break and Goto Statement.

UNIT-IV: Arrays

Arrays: Arrays, One dimensional array, Various Operation on Array (Inserting of Element, Deleting of Element, Rotating List, Sorting, Searching, Merging Etc) and Two dimensional arrays (Matrix Addition, Transpose of Matrix, Matrix Multiplication), Modular programming and its features.

Books:

1) Anil V. Chouduri, "The Art of Programming through Flowchart and Algorithms", Laxmi Pub. ISBN-8170087791
2) Maureen Sprankle, "Problem Solving Programming Concepts", Pearson, 7th Edition, 2009 ISBN 81-317-0711-1
3) Behrouz Forouzan, "Basic of Computer Science",Cengage Leaning, ISBN 81-315-1118-9

References:

1) Donald Knuth,"The Art of Computer Programming Vol-I,II III", Pearson.
2) Horowitz, Sahani, "Fundamental of Computer Algorithm", Orient Longman, ISBN 9788173716126

B.Sc. – I (Computer Science)
SEMESTER - I
Practical

Practical based on IT, Office Automation

A)   Information Technology
   1. Study of various input devices with troubleshooting.

       a. To study and installation of keyboard.

       b. To study and installation of mouse.

   2. Study of various output devices.

       a. To study the installation of printer.

   3. To study the installation of multimedia.

   4. Study of different operating system.

   5. Study of booting process.

   6. To study assembling and deassembling the PC.

   7.   To study and installation of antivirus software

   8.   Procedure to cleanup Disk, Disk fragmentation

   9.   Things to know while purchasing the computer.

   B) Ms-Word

1.   a) Type the Content Heading and then set the Index option using Tab setting. Finally take a
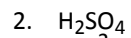   print out.

CONTENTS

            Chapter   **Page No.**

[Chapter names at 1" with left alignment while Page number at 4.5" with right alignment and with leader …..]

b) Draw a Block diagram of computer system using auto-shapes, and name them using textbox and join each parts using line-style. At the end give the page border to it. Finally take a print out.

c) Type the following set of equation. Finally take a printout.

1. $B^2 - 4AC = 0$
2. H_2SO_4
3. If $(A^2 \geq 0)$

4. $f(x) = \sum\limits_{i=1}^{i=5} 5 * X^i$

5. $k^2 - 4 = 0$, if $b_0 \neq 0$
6. $e^{i\theta} + e^{-i\theta} = 2\cos\theta$

Tip: Use Superscript, Subscript, Insert Symbol and Math equation
(Insert $\rightarrow$ Object $\rightarrow$ Microsoft Equation)

2.   Type the following letter and take printout

ABC
SAI Nagar
☎Mumbai
     020-1111111

Dear Sir,

        Kindly provide the **rate** of following set of peripherals,

➢ Computer 💻 with following configuration
   - Intel© Pentium© Processor T4400 (2.2 Ghz, 1MB L2 Cache, 800 MHz FSB)
   - 250 GB HDD, DVD RW, 35.56cms (14) CSV LED Backlit, 1GB DDR3 RAM
➢ Floppy disk 💾 of 1.44 MB of 12 Box
   • Sony
   • Verbatin
➢ 3-Button mouse 🖱 of following 5 each
   a) i-ball
   b) Logitech

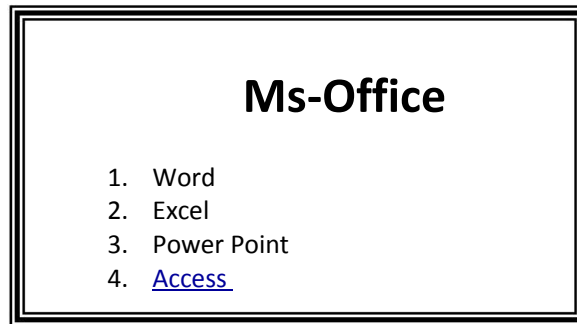Thanking you,

Date : < Insert System Date >   Your
                                                 XYZ

Tip: Use Bullet and Insert symbol option (Wingdings Font), System Date should be inserted throughInsert Date and Time Option.

3.   Type the following

> # Ms-Office
>
> 1. Word
> 2. Excel
> 3. Power Point
> 4. [Access](#)

a)   **Ms-Word:** MS-Word is the application software and one of the most powerful wordprocessor in Windows operating system. It is used for formatting of letters or the text. In simple meaning it is a word processor having various functions for text you may insert different objects like pictures, sound and video or calendar in word file.

b)   **Ms-Excel:** Ms-Excel is a powerful spreadsheet or worksheet application that can use formanaging, analyzing and presenting data in tabular format. It also helps to display data in graphical format using charts.

c)   **Ms-Power Point**: Ms-Powerpoint is a powerful tool to create professional lookingpresentation and slide shows.

d)   **Ms-Access**: Ms-Access is a powerful program to create and manage database.

Perform the following operation,

   i. When user presses on Access it should jump to Access Paragraph within page.
  ii. Similarly create a hyperlink for other option within a page.
  iii.Print it.

Tip: First of all create a book mark for word Ms-Access and then use hyperlink to word Access to linkwithin page for Ms-Access bookmark.

4.   Define and write the characteristic of computer and perform following operation,
   a.   Divide the text in two columns
   b.   Insert the picture of computer in the background in each column.
   c.   Insert header with your name
   d.   In footer write name of your college
   e.   Give proper heading for phrase.
   f.   Use Drop Cap for 1st letter of each paragraph
   g.   Define line spacing 1.5 with left margin 1.25" and right margin 0.75"
   h.   Font : Courier New, Font size for heading 14 and for normal text 11
   i.   Finally take a print out.

5. Type the following letter exactly as given below, Before start of typing, set up page in the following format

    1) Page Size : A4 with Landscape Orientation
    2) Left Margin: 2" Right Margin: 1" Top Margin: 0.5"

Computer Stream after 12th

- **Science Stream**
  - B.Sc (Computer Science)
  - B.Sc (IT)
  - BCA
  - B.E. (Computer Science)
  - B.E. (Information Technology)
- **Commerce Stream**
  - i. BCCA
  - ii. B.Com (Information Technology)

COMPUTER

[If Computer Picture is not loaded on your computer then simply select one of the pictures loaded in clip-art]

Tip: For writing a text in direction, In Text box write COMPUTER and then select Text Directionoption from Format menu. And For background, select textbox and use fill color.

6. Write a letter to publisher for supplying the list of books along with book details. For ex.

To,
    Publisher,
    Das Ganu Prakasan,
    Nagpur.

R/Sir,
    Supply following title of books at the earliest.

Sr.No.	Title	Author	No. of

			Copies
1	Information System	S.Kishor	10
2	Information Technology	S. Kishor	15
3	Principle of Business Management	S. Kishor	12
4	Financial Accounting	Dr. Kishor Mohrir	13

Thanking you,

Date: < Insert System Date >

Yours

Principal
(Dr. WWW)

Perform Following option

1) Take a printout

2) Assume Liberian forget to enter one of the entry of book so, kindly add it between number 3 and 4 say,

　　4　　　Business Economics Gurbir Kaur Khalsa　　　　10

3) Replace author name S. Kishor by S.B. Kishor at once.

4) Finally print the copy of this document with following settings,

- Left Margin　　　　= 1.75"
- Right Margin　　　　= 1"
- Top Margin　　　　= 1.5"
- Bottom Margin = 1"

[**Tip**: Formatting option and Table]

7.　　　Using Mail-Merge write a letter to all selected candidate for their final admission on specific date say (30-June) at XYZ Institute, with necessary documents at 10 AM.

Name should be highlighted while course and date of commencing class should be underlined
Tip: Assume at least 5 recipient students details (Name, Address, Course for Enroll) are entered in database.
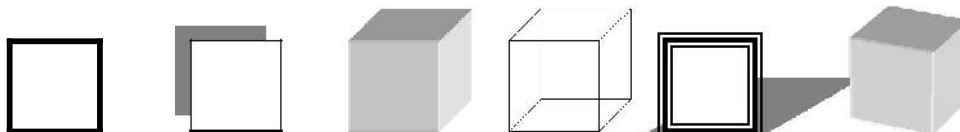
8.　　　Create a document and while saving give a security to open the saved document. Take a screen shot while opening it.
Tip : While Saving, select Security option from Tools Menu option.

9.　　　Draw the following shape using rectangle option found in Drawing Toolbar

And generate following types of box by copying and formatting above box

Tip : Use shadow-style and 3-D style found in Drawing Toolbar

C) MS-Excel

1) Prepare following table in a worksheet using MS-Excel.

Name	Basic	DA	HRA	Gross Pay	PF	Net Pay
Rahul	10000					
Sachin	20000					
Nilesh	15000					
Bharti	25000					

Perform following operations:-

1. Complete the table using formulas
   o DA = Basic * 27 %
   o Hra = Basic * 10 %
   o PF = Basic * 12.5 %
   o Gross Pay = Basic + DA + HRA
   o Net Pay = Gross Pay–PF
2. Give the Proper Heading.
3. Take the printout in landscape orientation

2) Enter following data in MS-Excel worksheet.

Name	Date of joining	Salary	Designation
Rahul	Jan-05	10000	Peon
Sachin	Oct-10	20000	Accountant
Nilesh	Jan-05	15000	Clerk
Bharti	Dec-09	25000	Manager

Perform following operations:-

1. Copy the above data and place in sheet2 and sort the table in the ascending order or date of joining and give proper heading.
2. Copy the above data and place in sheet3 and sort the table in the ascending order or date of joining followed by order of name and give proper heading.
3. Copy all the above data to sheet4 and take printout

3) Prepare following using MS-Excel.

Players	Match 1	Match 2	Match 3	Average	Highest Score	Sum
Sehwag	78	43	91			
Sachin	45	77	62			
Yuvraj	65	80	37			
Dhoni	34	15	46			
Raina	23	75	55			

Perform following:-

a. Calculate Average and High score of each player using AVERAGE & MAX function
b. Calculate total score of each match using SUM function.
c. Sort above records in descending order on the basis of average.
d. Take the printout in landscape orientation

4) Prepare the Mark sheet of IT subject on the basic of 3 Unit test. Each of 30 Marks and perform following,
   1. Calculate total marks, Average and Grade

2. Auto format to the above table.
3. Take the printout

5) Prepare the multiplication using
        1) Relative cell reference
        2) Absolute cell reference.

Multiplicand	Multiplier	Product using Relative	Product using Absolute
13	1		
	2		
	3		
	:		
	:		
	10		

6) Create profit and prepare a column chart in MS-EXCEL using the data.

Month	Net Sales	Actual Cost	Profit
Jan. 10	22000	18000	
Feb. 10	245005	9555	
Mar. 10	32450	24850	

Perform following operations:-
        a. Find the profit
        b. Give a chart title "Profit Report"
        c. Take the printout.

7) Draw Pie chart of following excel sheet.

Bowler	Over	Maiden	Runs	Wickets
Zaheer	10	2	22	3
Ishant	10	1	36	2
Harbhajan	10	0	48	2
Mishra	10	0	37	3
Yuvraj	10	0	43	0
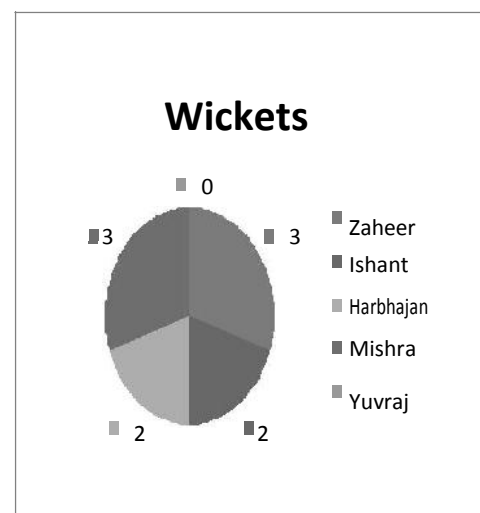
D) Ms-Powerpoint

1. Prepare the following slides with the information given below:

- Select the slide of your choice and write about yourself.
- Write about your family members name with relation. **Tip**: By using Title and 2 column text
- Using Title Content and text slide insert the picture of your favorite hero with the list of their movies.
- Finally run the slide continuously until ESC key is not pressed.

At last, write the steps that you have perform.

2. Create the following slide.

1. Change the bullet style in the first and the second level.
2. Change the case of the first level text to upper case and second level text to lower case.(By using Change Case option)
3. Change the attribute of the text to: Font : Arial, Font Style : Italics, Size:20
4. Justify the text.

3. Select the 10 slides of your choice. Apply the following settings and write the steps you have perform in each options.

- o   Insert page number in each slide
- o   Timer should be displayed during execution.
- o   Change the background color of each slide.
- o   Set the interval time for each slide to be displayed.
- o   Use Flash bulb animation in your presentation.
- o   Select a Color Schemes of your choice.
- o   Insert Chart in one of your slide.
- o   Insert a table in your presentation

B.Sc. - I (Computer Science)
SEMESTER- II
PAPER –I: OPERATING SYSTEM

UNIT -I: Introduction to Operating System
Operating System: Introduction, Purpose, Function And Role Of Operating System.
Types of OS: Concepts of Batch, Multi Programmed, Time Sharing, Parallel, Real Time AndDistributed.
Computer System Structure: Computer System Operation, I/O Structure, I/O Interrupt,DMA Structure, Storage Structure And Storage Hierarchy.
Hardware Protection: Dual Mode Operation, I/O Memory And CPU Protection, GeneralSystem Architecture.

UNIT -II: Operating System Structure
System Components: Process ,Main Memory, File I/O System, Secondary StorageManagement, Networking, Protection System, Command Interpreter System, Operating System Services, System Call.
Process And Job Control: Process And Types Of Process, Process State, Operation OnProcess, File Manipulation Device Management, Information Maintenance, And Communication.
System Structure: Simple Layered Approach, System Administrator.

UNIT - III: Linux
Structure of Linux Operating System, Exploring the directory structure, Naming files and directories
Shell: Bourne, Korn and C-Shells
File System Commands: ls, mkdir, rmdir, cd, cat, mv, cp, rm, ln, pwd,
moreText editing with vi editor

UNIT IV: Shell Scripts
Pipe and Filters: sort, grep, egrep **Permission modes:** chmod, chown, chgrp **Process:** ps,kill
Communication, **Shell Scripts:** Variables, Arithmetic in Shell Script, Control flow statements, Shell Parameters

Books:

1) Andrew S.Tanenbaum, "Modern Operating Systems" ,Second Edition, PHI.
2) Jack Tackett, Jr. and Steven Burnett, "Using Linux", PHI (5th Ed)
3) Brian Proffitt, "Install Configure and Customize (Red Hat Linux 7)", PHI
4) Grant Taylor, "Linux Complete" , BPB pub., ISBN : 81-7656-170-3

References:
1) Brain Proffitt, "Red Hat Linux 7",PHI.
2)   Abraham Silbeschatz, "Operating System Concepts", Bell Labs Peter Baergalvin Replika Press Pvt. Ltd.Delhi,
3) "Teach Linux in 24 hours",SAMS Techmedia,ISBN:81-7635-499-6.

B.Sc. – I (Computer Science)
SEMESTER - II
Paper-II: STRUCTURED PROGRAMMING WITH 'C'

UNIT–I: Programming Logic and Basic Elements of 'C' Programming

Programming Logic: Problem Analysis, Process Analysis, Conceptual Development ofsolution. **Development Tools:** Algorithm, Flowchart

Translator: Interpreter, Compiler

Introduction to C: C-Character Set and Keyboards, Constants and Variables, Data types,Type Casting, Type Modification,

Operators and Expressions – Arithmetic, Relational, Logical Assignment, Bitwise and Increment and Decrement Operator

Input and Output statements in C.

UNIT–II: Storage Class and Control Statement
Storage Class: auto, static, extern, static
Conditional Statement: if-else, nested if, else-if ladder, switch, Ternary Operator

Looping Statement: for loop, while and do- while loop, Comma Operator and Use of break,continue and goto statements

UNIT–III: Arrays, Structure, Functions
Arrays: Definition, Types of Arrays, Initialization of Single and Two dimension array,Writing and Reading data from an array, Bounce Checking, Searching. Sorting and Merging of two array,

String: String Manipulation using string library functions.

Structure: Need of Structure, period operator, Initializing Structure, sizeof(), Arrays ofStructure, Nested Structures.

Unions: Concept and applications, enum

UNIT–IV: Function, Pointer and File Concept
Function: Arithmetic and String Library Function, User defined functions, use of void,Recursion.

Pointer: Declaring and Initializing pointer variable, Pointer Operator, Call by value and Callby Reference

Dynamic Memory Management Functions: malloc ( ), calloc(), realloc(), feee()

Files: Basic Concept of file, Operation on Files, Defining, Opening and closing files, Modesof Files

Books:

1) E. Balguruswami, "Programming in ANSI C", TMH, 2009, ISBN-978-0-07-064822-7/0-07-064822-0

2) Dr. S.B. Kishor, Dr. V. Godki, S. Madhavi,"Gateway to C Programming",Lambert Pub. Germany, ISBN 9783845414744

References:

1) RAJARAMAN, "COMPUTER PROGRAMMING IN C" ,PHI, 2002, ISBN-81-203-0859-X

2) K.R. Venugopal and S.R. Prasad, "Mastering C", TMH, 2008, ISBN-13:978-0-07-061667-7 / 10: 0-07-06-1667-1.

B.Sc. – I (Computer Science)
SEMESTER - II
Practical

OS & LINUX PRACTICAL LIST

PRACTICAL BASAED ON OPERATING SYSTEM USING C

1) A PROGRAM TO FIND THE TOTAL BASE MEMORY

2) A PROGRAM TO FIND THE TOTAL FREE SPACE MEMORY

3) A PROGRAM TO FIND TO KNOW BOOT DRIVE DISK

4) A PROGRAM TO FIND NO. OF DRIVE ATTACH TO SYSTEM

5) A PRGRAM TOKNOW THE VARIOUS INFORMATION OF DISK

6) A PROGRAM TO KNOW THE VARIOUS STATUS OF EQUIPMENT LIKE NUMBER OF PRALLEL PORT, SERIAL AND GAME PORT IS PRESENT OR NOT, TYPE OF VIDEO MODE

7) A PROGRAM TO CHECK MATH-COPROCESSOR IS INSTALLED OR NOT

8) A PROGRAM TO PRINT SYSTEM DATE, TIME AND TO CHECK WHEHTER MOUSE IS INSTALLED OR NOT.

9) A PROGRAM TO KNOW THE STATUS OF IMPORTANT KEY ON KEYBORD

PRACTICAL BASAED ON LINUX

1) **Perform the following Directory Commands**

   a) pwd b) ls c) mkdir d) cd e) rmdir

2) **Perform the following File management Commands**

   a. Cat b) cp c) ln d) rm e)more f) mv

3) A Shell Script to perform various arithematic operations.

4) A Shell Script that takes two numbers from keybord and display their average as an output.

5) A Shell Script to display current date, users who have logged in , process status and calendar of the month.

C PRACTICAL

1) A program to find simple and compound interest for the rate of interest.

2) A program to find corresponding temperature in Fahrenheit from a given temperature in Celsius.

3) A Program to accept decimal number and display equivalent number in Octal and Hexadecimal.

4) A program to swap the contents of two variables.

5) Program to accept the distance between two cities in Kilometer and print the distance in meter, feet, inches and centimeter.

6) Program to accept the two sides and angle included by these two sides to find area and third side of a Triangle.

7) To check a number is even or odd.

8) A program for testing leap year.

9) A program to find largest among any five number with minimum condition.

10) A program to find roots of Quadratic equation ax2+bx+c.

11) Consider the example where we want to print all the prime number between 10 to 100.

12) Program to print multiplication Table of a number.

13) A program to print number, square and cube of the first 10 natural number.

14) A program to find the factorial of a integer number.

15) A program to generate and print Fibonacci sequences.

16) A program to print first 5 lines of the following pyramid.

    1

     1   2

     1   2   3

     1   2   3   4

     1   2   3   4 5

   18) A program to print first n lines of the following Pyramid.

```
                    1

               2     2

          3    3        3

       4    4    4     4

    5   5    5     5    5
```

19) A program to find the GCD of two Positive integers by successive division.

20) A Program to find the number of Armstrong number between 123 to 425.

21) A program to print truth table from X* Y+Z.

22) A Program to generate a menu driven program using switch statement.

       1) Add

       2) Edit.

       3) Delete.

       4) Exit.

23) A Program to find sum of two matrices having size m*n and p*q.

24) A Program to Transport the matrix of size M*N.

25) A Program to delete an element from list of N number.

26) A Program to find sum of each row and column of matrix and also find largest and smallest element in the given matrix.

27) A program to count number of characters including uppercase and lowercase letter, digits, punctuations, space and words that are entered in a given string.

28) A Program to enter the marks of 5 subjects of 3 students and also find the total marks of each student using structure with array.

29) A Program to accept the containing 10 number and pass it to function to print it.

30) A program to evaluation following series.

$$e^{x} = 1 + x + x^{2}/2! + x^{3}/3! + x^{4}/4! + \text{-------------} + x^{n}/n!$$

31) A program to define and accept the element of structure

       1) Empno.

2) Name

3) Basic pay and display the same structure along with DA, CCAand gross salary.

DA and CCA are calculated as follows.

DA= 91% of basic salary

CCA= RS 100/- consolidation.

32) A program to Sort the string using Pointer.

33) A function length () which count the length (number of character in the given string.)

34) A function copystr () which will copy the contents of string into another.

35) A function concat () with will concatenation the string t to the end of string s.

36) A program to simulate DOS TYPE command.

37) A program to count number of characters include uppercase and lowercase latter, digits, punctuations, space, words and number of lines in given file.

38) A program to create data file "Student.dat" having fields, Rollno, Name and Address

39) A program to read and display the contents of data file "Student.dat"