B.A and B.Sc (Life Sciences) with Computer Application Syllabus

Under the

CHOICE BASED CREDIT SYSTEM
(With effect from 2016-17)

DEPARTMENT OF COMPUTER SCIENCE
Kakatiya University, Warangal-506009
<table>
<thead>
<tr>
<th>Semester</th>
<th>Code</th>
<th>Subject</th>
<th>Workload per week (Theory/Practical)</th>
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<td>2</td>
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<td></td>
<td>B</td>
<td>Software Engineering</td>
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<td></td>
<td>C</td>
<td>PHP Programming</td>
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<td></td>
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Core 1: Computer Fundamentals

Unit – I

The Computer System Hardware: Introduction, Central Processing Unit, Memory Unit, Instruction Format, Instruction Set, Instruction Cycle, Microprocessor, Interconnecting the Units of a Computer, Performance of a Computer, Inside a Computer Cabinet

Computer Memory: Introduction, Memory Representation, Memory Hierarchy, CPU Registers, Cache Memory, Primary Memory, Secondary Memory, Access Types of Storage Devices, Magnetic Tape, Magnetic Disk, Optical Disk, Magneto-Optical Disk, Using the Computer Memory.

Unit – II

Data Representation: Introduction, Number System, Conversion from Decimal to Binary, Octal, Hexadecimal, Conversion of Binary, Octal, Hexadecimal to Decimal, Conversion of Binary to Octal, Hexadecimal, Conversion of Octal, Hexadecimal to Binary, Binary Arithmetic, Signed and Unsigned Numbers, Binary Data Representation, Binary Coding Schemes, Logic Gates.


Unit – III


The Internet and Internet Services: Introduction, History of Internet, Internetworking Protocol, the Internet Architecture, Managing the Internet, Connecting to Internet, Internet Connections, Internet Address, Internet Services, Uses of Internet.

Unit IV


Text Books:


References:

Practical: Computer Fundamentals

NOTE:

- All the concepts of programs from Text Book including exercises must be practice, execute and write down in the practical record book.
- Faculty must take care about UG standard programs it should be minimum 25 – 30.
- In the external lab examination student has to execute at least three programs with compilation and deployment steps are necessary.
- External Viva-voce is compulsory.

Example programs:

The practical assignment must include connecting parts of a computer and assembling it to an extent, media formatting and installation of some software.

Practical exercises based on Open Office tools using document preparation and spreadsheet handling packages.

Text Editor

1. Prepare a grocery list having four columns (Serial number, The name of the product, quantity and price) for the month of April, 06.
   - Font specifications for Title (Grocery List): 14-point Arial font in bold and italics.
   - The headings of the columns should be in 12-point and bold.
   - The rest of the document should be in 10-point Times New Roman.
   - Leave a gap of 12-points after the title.

2. Create a telephone directory.
   - The heading should be 16-point Arial Font in bold
   - The rest of the document should use 10-point font size
   - Other headings should use 10-point Courier New Font.
   - The footer should show the page number as well as the date last updated.

3. Design a time-table form for your college.
   - The first line should mention the name of the college in 16-point Arial Font and should be bold.
   - The second line should give the course name/teacher’s name and the department in 14-point Arial.
   - Leave a gap of 12-points.
   - The rest of the document should use 10-point Times New Roman font.
   - The footer should contain your specifications as the designer and date of creation.

4. BPB Publications plans to release a new book designed as per your syllabus. Design the first page of the book as per the given specifications.
• The title of the book should appear in bold using 20-point Arial font.
• The name of the author and his qualifications should be in the center of the page in 16-point Arial font.
• At the bottom of the document should be the name of the publisher and address in 16-point Times New Roman.
• The details of the offices of the publisher (only location) should appear in the footer.

5. Create the following one page documents.
   a. Compose a note inviting friends to a get-together at your house, including a list of things to bring with them.
   b. Design a certificate in landscape orientation with a border around the document.
   c. Design a Garage Sale sign.
   d. Make a sign outlining your rules for your bedroom at home, using a numbered list.

6. Create the following documents:
   • A newsletter with a headline and 2 columns in portrait orientation, including at least one image surrounded by text.
   • Use a newsletter format to promote upcoming projects or events in your classroom or college.
   • Convert following text to a table, using comma as delimiter
   • Type the following as shown (do not bold).
     **Color, Style, Item**
     Blue, A980, Van
     Red, X023, Car
     Green, YL724, Truck
     **Name, Age, Sex**
     Bob, 23, M
     Linda, 46, F
     Tom, 29, M

7. Enter the following data into a table given on the next page.

<table>
<thead>
<tr>
<th>Salesperson</th>
<th>Dolls</th>
<th>Trucks</th>
<th>Puzzles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kennedy, Sally</td>
<td>1327</td>
<td>1423</td>
<td>1193</td>
</tr>
<tr>
<td>White, Pete</td>
<td>1421</td>
<td>3863</td>
<td>2934</td>
</tr>
<tr>
<td>Pillar, James</td>
<td>5214</td>
<td>3247</td>
<td>5467</td>
</tr>
<tr>
<td>York, George</td>
<td>2190</td>
<td>1278</td>
<td>1928</td>
</tr>
</tbody>
</table>
Add a column Region (values: S, N, N,S,S,S) between the Salesperson and Dolls columns to the given table. Sort your table data by Region and within Region by Salesperson in ascending order:

In this exercise, you will add a new row to your table, place the word "Total" at the bottom of the Salesperson column, and sum the Dolls, Trucks, and Puzzles columns.

8. Wrapping of text around the image.

9. Create your resume by incorporating most of the options learned till now.

10. Following features of menu option must be covered:

   FILE  Complete menu
   EDIT  Complete menu
   VIEW  Complete menu
   INSERT  Complete menu
   FORMATT  Complete menu
   TABLE  Complete menu
   WINDOW  Complete menu
   HELP  Complete menu
   TOOLS All options except Online collaboration, Tools on Macro, Templates

**Spreadsheet**

1. Enter the following data in Excel Sheet:

   REGIONAL SALES PROJECTION

<table>
<thead>
<tr>
<th>State</th>
<th>Qtr1</th>
<th>Qtr2</th>
<th>Qtr3</th>
<th>QTR4</th>
<th>Qtr Total</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delhi</td>
<td>2020</td>
<td>2400</td>
<td>2100</td>
<td>3000</td>
<td></td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Punjab</td>
<td></td>
<td>1100</td>
<td>1300</td>
<td>1500</td>
<td>1400</td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>U.P.</td>
<td>3000</td>
<td>3200</td>
<td>2600</td>
<td>2800</td>
<td></td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Harayana</td>
<td>1800</td>
<td>2000</td>
<td>2200</td>
<td>2700</td>
<td></td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Rajasthan</td>
<td>2100</td>
<td>2000</td>
<td>1800</td>
<td>2200</td>
<td></td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL

AVERAGE

(a) Apply Formatting as follow:

1. Title in TIMES NEW ROMAN  
2. Font Size - 14  
3. Remaining text - ARIAL, Font Size -10
iv. State names and Qtr. Heading Bold, Italic with Gray Fill Color.
v. Numbers in two decimal places.
vi. Qtr. Heading in center Alignment.

Vii. Apply Border to whole data.

(b) Calculate State and Qtr. Total
(c) Calculate Average for each quarter
(d) Calculate Amount = Rate * Total.

2. Given the following worksheet

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Roll No.</td>
<td>Name</td>
<td>Marks</td>
<td>Grade</td>
</tr>
<tr>
<td>2</td>
<td>1001</td>
<td>Sachin</td>
<td>99</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1002</td>
<td>Sehwag</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1003</td>
<td>Rahul</td>
<td>41</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1004</td>
<td>Sourav</td>
<td>89</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>1005</td>
<td>Har Bhajan</td>
<td>56</td>
<td></td>
</tr>
</tbody>
</table>

Calculate the grade of these students on the basis of following guidelines:

If Marks

>= 80   Then Grade

A+

10 >= 60 < 80   A

>= 50 < 60   B

< 50   F

3. Given the following worksheet

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Salesman</td>
<td>Sales in (Rs.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>No.</td>
<td>Qtr1</td>
<td>Qtr2</td>
<td>Qtr3</td>
<td>Qtr4</td>
<td>Total</td>
<td>Commission</td>
</tr>
<tr>
<td>3</td>
<td>S001</td>
<td>5000</td>
<td>8500</td>
<td>12000</td>
<td>9000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>S002</td>
<td>7000</td>
<td>4000</td>
<td>7500</td>
<td>11000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>S003</td>
<td>4000</td>
<td>9000</td>
<td>6500</td>
<td>8200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>S004</td>
<td>5500</td>
<td>6900</td>
<td>4500</td>
<td>0500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>S005</td>
<td>7400</td>
<td>8500</td>
<td>9200</td>
<td>8300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>S006</td>
<td>5300</td>
<td>7600</td>
<td>9800</td>
<td>6100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Calculate the commission earned by the salesmen on the basis of following Candidates:

If Total Sales

< 20000    Commission

0% of sales

> 20000 and < 25000 4% of sales
> 25000 and < 30000 5.5% of sales
> 30000 and < 35000 8% of sales
>= 35000 11% of sales

The total sales is sum of sales of all the four quarters.

4. A company XYZ Ltd. pays a monthly salary to its employees which consists of basic salary, allowances & deductions. The details of allowances and deductions are as follows:

**Allowances**

- HRA Dependent on Basic
  - 30% of Basic if Basic <=1000
  - 25% of Basic if Basic>1000 & Basic<=3000
  - 20% of Basic if Basic >3000

- DA Fixed for all employees, 30% of Basic

- Conveyance Allowance
  - Rs. 50/- if Basic is <=1000
  - Rs. 75/- if Basic >1000 & Basic<=2000
  - Rs. 100 if Basic >2000

- Entertainment Allowance NIL if Basic is <=1000
  - Rs. 100/- if Basic > 1000

**Deductions**

- Provident Fund 6% of Basic

- Group Insurance Premium Rs. 40/- if Basic is <=1500
  - Rs. 60/- if Basic > 1500 & Basic<=3000
  - Rs. 80/- if Basic >3000

Calculate the following:

Gross Salary = Basic + HRA + DA + Conveyance + Entertainment

Total deduction = Provident Fund + Group Insurance Premium

Net Salary = Gross Salary – Total Deduction

5. Create Payment Table for a fixed Principal amount, variable rate of interests and time in the format below:

<table>
<thead>
<tr>
<th>No. of Instalments</th>
<th>5%</th>
<th>6%</th>
<th>7%</th>
<th>8%</th>
<th>9%</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>XX</td>
<td>XX</td>
<td>XX</td>
<td>XX</td>
<td>XX</td>
</tr>
<tr>
<td>4</td>
<td>XX</td>
<td>XX</td>
<td>XX</td>
<td>XX</td>
<td>XX</td>
</tr>
<tr>
<td>5</td>
<td>XX</td>
<td>XX</td>
<td>XX</td>
<td>XX</td>
<td>XX</td>
</tr>
<tr>
<td>6</td>
<td>XX</td>
<td>XX</td>
<td>XX</td>
<td>XX</td>
<td>XX</td>
</tr>
</tbody>
</table>
6. Use an array formula to calculate Simple Interest for given principal amounts given the rate of Interest and time

<table>
<thead>
<tr>
<th>Rate of Interest</th>
<th>8%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>5 Years</td>
</tr>
<tr>
<td>Principal</td>
<td>Simple Interest</td>
</tr>
<tr>
<td>1000</td>
<td>?</td>
</tr>
<tr>
<td>18000</td>
<td>?</td>
</tr>
<tr>
<td>5200</td>
<td>?</td>
</tr>
</tbody>
</table>

7. The following table gives year wise sale figure of five salesmen in Rs.

<table>
<thead>
<tr>
<th>Salesman</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>10000</td>
<td>12000</td>
<td>20000</td>
<td>50000</td>
</tr>
<tr>
<td>S2</td>
<td>15000</td>
<td>18000</td>
<td>50000</td>
<td>60000</td>
</tr>
<tr>
<td>S3</td>
<td>20000</td>
<td>22000</td>
<td>70000</td>
<td>70000</td>
</tr>
<tr>
<td>S4</td>
<td>30000</td>
<td>30000</td>
<td>100000</td>
<td>80000</td>
</tr>
<tr>
<td>S5</td>
<td>40000</td>
<td>45000</td>
<td>125000</td>
<td>90000</td>
</tr>
</tbody>
</table>

(a) Calculate total sale year wise.
(b) Calculate the net sale made by each salesman
(c) Calculate the maximum sale made by the salesman
(d) Calculate the commission for each salesman under the condition.
   (i) If total sales >4,00,000 give 5% commission on total sale made by the salesman.
   (ii) Otherwise give 2% commission.
(e) Draw a bar graph representing the sale made by each salesman.
(f) Draw a pie graph representing the sale made by salesman in 2000.

8. Enter the following data in Excel Sheet

**PERSONAL BUDGET FOR FIRST QUARTER**

**Monthly Income (Net): 1,475**

<table>
<thead>
<tr>
<th>EXPENSES</th>
<th>JAN</th>
<th>FEB</th>
<th>MARCH</th>
<th>QUARTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AVERAGE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Rent          | 600.00 | 600.00 | 600.00 |
| Telephone     | 48.25  | 43.50  | 60.00  |
| Utilities     | 67.27  | 110.00 | 70.00  |
| Credit Card   | 200.00 | 110.00 | 70.00  |
| Oil           | 100.00 | 150.00 | 90.00  |
| AV to Insurance | 150.00 |       |       |
Cable TV 40.75 40.75 40.75

**Monthly Total**
(a) Calculate Quarter total and Quarter average.
(b) Calculate Monthly total.
(c) Surplus = Monthly income - Monthly total.
(d) What would be total surplus if monthly income is 1500.
(e) How much does telephone expense for March differ from quarter average.
(f) Create a 3D column graph for telephone and utilities.
(g) Create a pie chart for monthly expenses.

9. Enter the following data in Excel Sheet

<table>
<thead>
<tr>
<th>Publisher name</th>
<th>1997</th>
<th>1998</th>
<th>1999</th>
<th>2000</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Rs. 1,000.00</td>
<td>Rs. 1,100.00</td>
<td>Rs. 1,300.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Rs. 1,500.00</td>
<td>Rs. 700.00</td>
<td>Rs. 1,000.00</td>
<td></td>
<td>Rs. 2,200.00</td>
</tr>
<tr>
<td>C</td>
<td>Rs. 700.00</td>
<td>Rs. 900.00</td>
<td>Rs. 1,500.00</td>
<td>Rs. 600.00</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Rs. 1,200.00</td>
<td>Rs. 500.00</td>
<td>Rs. 200.00</td>
<td>Rs. 1,100.00</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Rs 800.00</td>
<td>Rs. 1,000.00</td>
<td>Rs. 3,000.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) Compute the total revenue earned.
(b) Plot the line chart to compare the revenue of all publisher for 4 years.
(c) Chart Title should be Total Revenue of sam’s Bookstall (1997-2000)’
(c) Give appropriate categories and value axis title.

10. Generate 25 random numbers between 0 & 100 and find their sum, average and count. How many no. are in range 50-60
Core 2: Computer Programming with C

Unit - I


Overview of C: History of C, Importance of C, Sample Programs, Basic Structure of C Programs, Programming Style, Executing a 'C' Program.

Constants, Variables, and Data Types: Introduction, Character set, C tokens, Keywords and Identifiers, Constants, Variables, Data Types, Declaration of Variables, Declaration of Storage Class, Assigning Values to Variables, Defining Symbolic Constant, Declaring Variable as Constant and Volatile, Overflow and Underflow of Data.

Managing Input and Output Operations: Introduction, Reading a Character, Writing a Character, Formatted Input and Output.


Unit – II


Decision Making and Looping: Introduction, The While statement, the do Statement, the For Statement, Jumps in Loops.

Arrays: Introduction, One-dimensional Arrays, Declaration and Initialization of One-dimensional Arrays, Two-dimensional Arrays, Initializing two-dimensional Arrays, Multi-dimensional Arrays, Dynamic Arrays.

Unit III

Character Arrays and Strings: Introduction, Declaring and Initializing String Variables, Reading Strings from Terminal, Writing Strings to Screen, Arithmetic Operations on Characters, Putting Strings together, Comparison of Two Strings, String-handling Functions, Table of Strings, Other Features of Strings.

User-Defined Functions: Introduction, Need for User-Defined Functions, A Multifunction Program, Elements of user-defined Functions, Definition of Functions, Return Value and their Types, Function Calls, Function Declaration, Category of Functions, No Arguments and No Return Values, Arguments but No Return Values, Arguments with Return Values, No Arguments but Returns a Value, Functions that Return Multiple Values, Nesting of Functions, Recursion, Passing Arrays to Functions, Passing Strings to Functions, The Scope, Visibility and Lifetime of Variables, Multifile Programs.
Unit- IV

Pointers: Introduction, Understanding Pointers, Accessing the Address of a Variable, Declaring Pointer Variables, Initialization of pointer variables, Accessing a Variable through its pointer, Chain of Pointers, Pointer Expressions, Pointer Increments and Scale Factor, Pointers and Arrays, Pointer and Arrays, Pointers and Character Strings, Arrays of Pointers, Pointers as Function Arguments, Functions Returning Pointers, Pointers to Functions, Pointers and Structures.


Text Book:


References:

Practical: Computer Programming with C

NOTE:

- All the concepts of programs from Text Book including exercises must be practice, execute and write down in the practical record book.
- Faculty must take care about UG standard programs it should be minimum 25 – 30.
- In the external lab examination student has to execute at least three programs with compilation and deployment steps are necessary.
- External Viva-voce is compulsory.

Example programs:

1. Write a c program for electricity bill tacking different categories of users, different slabs in each category. (using nested if else statement)

2. Write a c program to evaluate the following using loops
   a. \(1\times2/2!+x^4/4!+\ldots\)upto 5 terms
   b. \(x+x^3/3!+x^5/5!+\ldots\)upto 5 terms

3. Write a c program to check whether the given number is
   a. Prime or not
   b. Perfect or abundant or deficient

4. Write a c program to find the mean, mode, median, and variance of list of values by using one dimensional array

5. Write a menu driven program to read a list of numbers and perform the following operations
   a. Print the list
   b. Delete duplicates from the list
   c. Reverse the list

6. Write a program to read a list of numbers and search for given number using binary search algorithm and if found display its index otherwise display the message "element not found in the list" using functions

7. Write a menu driven program to read two matrices and compute their sum and product using functions

8. Write a menu driven program to read list of student names and perform the following operations using functions.
   a. To print list of names
   b. To sort them in ascending order
   c. To print the list after sorting

9. Write a c program that consists of recursive functions to find
   a. Factorial of a given number
   b. Print the pascal triangle using binomial theorem
10. Write a menu driven program to read list of student names and perform the following operations using array of character pointers.
   a. To insert a student name
   b. To delete a name
   c. To print the names
Core 3: Database Management System

Unit 1
Introduction to Databases: Databases and Database Users, Introduction, Example, Characteristics of the Database Approach, Actors on the Scene, Workers behind the Scene, Advantages of Using the DBMS Approach, History of Database Applications, When Not to Use a DBMS.

Database System Concepts and Architecture: Data Models, Schemas, and Instances, Three-Schema Architecture and Data Independence, Database Languages and Interfaces, the Database System Environment, Centralized and Client/Server Architectures for DBMSs, Classification of Database Management Systems.

Data Models: Data Modelling and Data Models, the Importance of Data Models, Data Model Basic Building Blocks, Business Rules, the Evolution of Data Models, Degrees of Data Abstraction

Unit II
The Relational Database Model: Logical View of Data, Keys, Integrity Rules, Relational Set Operators, The Data Dictionary and the System Catalog, Relationships within the Relational Database, Data Redundancy Revisited, Indexes.


Unit III
ADVANCED DATA MODELING: The Extended Entity Relationship Model, Entity Clustering, Entity Integrity: Selecting Primary Keys.


Unit IV
Introduction to Structured Query Language (SQL): Introduction to SQL, Data Definition Commands, Data Manipulation Commands, SELECT Queries, Advanced Data Definition Commands, Advanced SELECT Queries, Virtual Tables: Creating a View, Joining Database Tables.

Advanced SQL: Relational Set Operators, SQL Join Operators, Subqueries and Correlated Queries, SQL Functions, Oracle Sequences, Updatable Views, Procedural SQL, Embedded SQL.

Text Books:


Book references:

Practical: Database Management System

NOTE:

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- Faculty must take care about UG standard programs it should be minimum 25 – 30.
- In the external lab examination student has to execute at least three programs with compilation and deployment steps are necessary.
- External Viva-voce is compulsory.

Example programs:

1. Create a database having two tables with the specified fields, to computerize a library system of a Delhi University College.

   **LibraryBooks** *(Accession number, Title, Author, Department, PurchaseDate, Price)*

   **IssuedBooks** *(Accession number, Borrower)*

   a) Identify primary and foreign keys. Create the tables and insert at least 5 records in each table.

   b) Delete the record of book titled “Database System Concepts”.

   c) Change the Department of the book titled “Discrete Maths” to “CS”.

   d) List all books that belong to “CS” department.

   e) List all books that belong to “CS” department and are written by author “Navathe”.

   f) List all computer (Department=”CS”) that have been issued.

   g) List all books which have a price less than 500 or purchased between “01/01/1999” and “01/01/2004”.

2. Create a database having three tables to store the details of students of Computer Department in your college.

   **Personal information about Student** *(College roll number, Name of student, Date of birth, Address, Marks(rounded off to whole number) in percentage at 10 + 2, Phone number)*

   **Paper Details** *(Paper code, Name of the Paper)*

   **Student’s Academic and Attendance details** *(College roll number, Paper code, Attendance, Marks in home examination)*.

   a) Identify primary and foreign keys. Create the tables and insert at least 5 records in each table.

   b) Design a query that will return the records (from the second table) along with the name of student from the first table, related to students who have more than 75% attendance and more than 60% marks in paper 2.
c) List all students who live in “Delhi” and have marks greater than 60 in paper 1.

d) Find the total attendance and total marks obtained by each student.

c) List the name of student who has got the highest marks in paper 2.

3. Create the following tables and answer the queries given below:

Customer (CustID, email, Name, Phone, ReferrerID)
Bicycle (BicycleID, DatePurchased, Color, CustID, ModelNo)
BicycleModel (ModelNo, Manufacturer, Style)
Service (StartDate, BicycleID, EndDate)

a) Identify primary and foreign keys. Create the tables and insert at least 5 records in each table.

b) List all the customers who have the bicycles manufactured by manufacturer “Honda”.

c) List the bicycles purchased by the customers who have been referred by customer “C1”.

d) List the manufacturer of red colored bicycles.

e) List the models of the bicycles given for service.

4. Create the following tables, enter at least 5 records in each table and answer the queries given below.

EMPLOYEE (Person_Name, Street, City)
WORKS (Person_Name, Company_Name, Salary)
COMPANY (Company_Name, City)
MANAGES (Person_Name, Manager_Name)

1. Identify primary and foreign keys.

2. Alter table employee, add a column “email” of type varchar(20).

3. Find the name of all managers who work for both Samba Bank and NCB Bank.

4. Find the names, street address and cities of residence and salary of all employees who work for “Samba Bank” and earn more than $10,000.

5. Find the names of all employees who live in the same city as the company for which they work.

6. Find the highest salary, lowest salary and average salary paid by each company.

7. Find the sum of salary and number of employees in each company.

8. Find the name of the company that pays highest salary.
5. Create the following tables, enter at least 5 records in each table and answer the queries given below.

**Suppliers (SNo, Sname, Status, SCity)**

**Parts (PNo, Pname, Colour, Weight, City)**

**Project (JNo, Jname, Jcity)**

**Shipment (Sno, Pno, Jno, Qunatity)**

a) Identify primary and foreign keys.

b) Get supplier numbers for suppliers in Paris with status>20.

c) Get suppliers details for suppliers who supply part P2. Display the supplier list in increasing order of supplier numbers.

d) Get suppliers names for suppliers who do not supply part P2.

e) For each shipment get full shipment details, including total shipment weights.

f) Get all the shipments where the quantity is in the range 300 to 750 inclusive.

g) Get part nos. for parts that either weigh more than 16 pounds or are supplied by suppliers S2, or both.

h) Get the names of cities that store more than five red parts.

i) Get full details of parts supplied by a supplier in Delhi.

j) Get part numbers for part supplied by a supplier in Allahabad to a project in Chennai.

k) Get the total number of project supplied by a supplier (say, S1).

l) Get the total quantity of a part (say, P1) supplied by a supplier (say, S1).
Core 4: Internet Technologies

Unit – I


Cascading StyleSheets - Introduction, Inline Styles, Embedded Style Sheets, Linking external sheets, Backgrounds, text flow and box model.

Unit - II

JavaScript- Introduction, simple programming, Obtaining User Input with prompt Dialogs, Operators (arithmetic, Decision making, assignment, logical, increment and decrement). Control Structures - if... else selection statement, while, do... while repetitions statement, for statement, switch statement, break and continue statements.

Functions - program modules in JavaScript, programmer defined functions, function definition, Random-number generator, scope rules, global functions, recursion,

Unit – III

JavaScript: Arrays, Objects - Math Object, String Object, Date Object, Boolean & Number Object, document and window Objects. Event Model - on click, on load, on error, onmouseover, onmouseout, on focus, on blur, on submit, on reset, more DHTML events.

Unit - IV


Text books:


References:

1. D.R. Brooks, An Introduction to HTML and Javascript for Scientists and Engineers, Springer

2. URL: www.wikipedias.org


Practical: Internet Technologies

NOTE:

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- Faculty must take care about UG standard programs it should be minimum 25 – 30.
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- External Viva-voce is compulsory.

Example programs:

Practical exercises based on concepts listed in theory using HTML.

1. Create HTML document with following formatting – Bold, Italics, Underline, Colors, Headings, Title, Font and Font Width, Background, Paragraph, Line Brakes, Horizontal Line, Blinking text as well as marquee text.
2. Create HTML document with Ordered and Unordered lists, Inserting Images, Internal and External linking
3. Create HTML document with Table:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th>Some image here</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. Create Form with Input Type, Select and Text Area in HTML.
5. Create an HTML containing Roll No., student's name and Grades in a tabular form.
6. Create an HTML document (having two frames) which will appear as follows:

<table>
<thead>
<tr>
<th>Department</th>
<th>About department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department1</td>
<td>This frame would show the contents according to the link clicked by the user on the left Frame.</td>
</tr>
<tr>
<td>Department1</td>
<td></td>
</tr>
<tr>
<td>Department1</td>
<td></td>
</tr>
</tbody>
</table>

7. Create an HTML document containing horizontal frames as follows:

<table>
<thead>
<tr>
<th>Department Names (could be along with Logos)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contents according to the Link clicked</td>
</tr>
</tbody>
</table>

8. Create a website of 6 – 7 pages with different effects as mentioned in above problems.
9. Create HTML documents (having multiple frames) in the following three formats:
10. Create a form using HTML which has the following types of controls:
   I. Text Box
   II. Option/radio buttons
   III. Check boxes
   IV. Reset and Submit buttons

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11. Create a student Bio-Data, using forms.

12. Create a web page using following style sheets
   i. Inline style sheets. ii. Embedded style sheets. iii. External style sheets

13. Create a web page using "class" style sheets with different "border-width" property values like thick, medium, thin, groove, inset, and outset, red & blue.

**JavaScript:**

Create event driven program for following:

1. Print a table of numbers from 5 to 15 and their squares and cubes using alert.

2. Print the largest of three numbers.
3. Find the factorial of a number n.
4. Enter a list of positive numbers terminated by Zero. Find the sum and average of these numbers.
5. A person deposits Rs 1000 in a fixed account yielding 5% interest. Compute the amount in the account at the end of each year for n years.
6. Read n numbers. Count the number of negative numbers, positive numbers and zeros in the list.
7. Write a JavaScript program to accept two values from form and apply any 5 mathematical functions.
8. Display the current date and time in both GMT and local form.
9. Write a JavaScript program on MouseOver, MouseOut, blur events.
10. Write a XML program using document type definitions
11. Write Student database with XML.
12. Write a XML program using XS
Core 5: Multimedia Systems and Applications

Unit I
Images: Before You Start to Create, Making Still Images, Color.

Unit II
Animation: The Power of Motion, Principles of Animation, Animation by Computer, Making Animations.

Unit III
Making Multimedia: The Stages of a Multimedia Project, the Intangibles, Hardware, Software, Authoring Systems
The Internet and Multimedia: Internet History, Internetworking, Multimedia on the Web.

Text book:

Reference books:


Practical: Multimedia Systems and Applications

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Example programs:

Practical exercises based on concepts listed in theory using Presentation tools in office automation tool/ GIMP/Blender / Audacity/ Animation Tools/ Image Editors/ Video Editors.

Implement the followings using Blender -

1. Create an animation using the tools panel and the properties panel to draw the following – Line, pen, oval, circle, rectangle, square, pencil, brush, lasso tool
2. Create an animation using text tool to set the font, size, color etc.
3. Create an animation using **Free transform tool** that should use followings-
   - Move Objects
   - Skew Objects
   - Stretch Objects
   - Rotate Objects
   - Stretch Objects while maintaining proportion
   - Rotate Objects after relocating the center dot
4. Create an animation using layers having following features-
   - Insert layer, Delete layer, guide layer, Mask layer.
5. Modify the document (changing background color etc.) Using the following tools
   - Eraser tool
   - Hand tool
   - Ink bottle tool
   - Zoom tool
   - Paint Bucket tool
   - Eyedropper tool
6. Create an animation for bus car race in which both starts from the same point and car wins the race.
7. Create an animation in which text Hello gets converted into GoodBye (using motion/shape tweening).
8. Create an animation having five images having fade-in fade-out effect.

9. Create an scene to show the sunrise (using multiple layers and motion tweening)

10. Create an animation to show the ripple effect.

11. Create an animation (using Shape tweening and shape hints) for transforming one shape into another.

12. Create an animation for bouncing ball (you may use motion guide layer).
Core 6: Visual Programming

Unit I

Introduction to VB: Writing windows application with VB, Programming languages -procedural, object oriented, event driven; VB Environment, Writing first VB project, compiling, debugging, and running the programs.

Controls: Introduction to controls textboxes, frames, check boxes, option buttons, images, setting borders and styles, the shape control, the line control, working with multiple controls and their properties, designing the user interface, keyboard access, tab controls, default & cancel property, coding for controls.

Variables, constants, and Calculation: Data types, naming rules and conversion, constants-named and intrinsic, declaring variables, scope of variables, val function, arithmetic operations, formatting data Counting and accumulating Sums.

Unit II

Decisions and Conditions: If statement, Conditions-comparing numeric variables and constants, comparing strings, compound conditions (and, or, not), nested if statements, using if statements with option buttons & check boxes, displaying message in message box, input validation. Calling event procedures, debugging VB projects, Debugging Step-by-Step Tutorial.

Modular programming: Menus, using common dialog box, writing general procedure.

Forms Handling: Multiple forms, creating, adding, removing forms, hide, show method, load, unload statement, me keyword, referring to objects on a different forms, Variables and constants in Multiple-Forms.

Iteration Handling: Lists Boxes and Combo Boxes, Do/loops, for/next loops, using msgbox function, using string function

Unit III

Arrays: control Arrays, the case structure, single-dimension arrays, for Each/Next statement, table lookup, using list boxes with array, multidimensional arrays.


Advanced topics in VB: ActiveX controls, Dynamic link libraries (DLL), Multiple Document interface (MDI).

Text Book:

Practical: Visual Programming

NOTE:

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- External Viva-voce is compulsory.

Example programs:

Note: - Use any open source alternative such as Ttkinter with Python SharpDevelop/GAMBAS/OPENXAVA with JAVA

1. Print a table of numbers from 5 to 15 and their squares and Cubes.
2. Print the largest of three numbers.
3. Find the factional of a number n.
4. Enter a list of positive numbers terminated by zero. Find the sum and average of these numbers.
5. A person deposits Rs. 1000 in a fixed account yielding 5% interest. Complete the amount in the account at the end of each year for n years.
6. Read n numbers. Count the number of negative numbers, positive numbers and zeros in the list.
7. Read n numbers. Count the number of negative numbers, positive numbers and zeroes in the list. use arrays.
8. Read a single dimension array. Find the sum and average of these numbers.
9. Read a two dimension array. Find the sum of two 2D Array.
10. Create a database Employee and Make a form to allow data entry to Employee Form with the following command buttons:

<table>
<thead>
<tr>
<th>Employee Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employee Name</td>
</tr>
<tr>
<td>Employee Id:</td>
</tr>
<tr>
<td>Date of Joining</td>
</tr>
<tr>
<td>Designation:</td>
</tr>
<tr>
<td>Department:</td>
</tr>
<tr>
<td>Address:</td>
</tr>
<tr>
<td>Basic Pay:</td>
</tr>
</tbody>
</table>

PREV  NEXT  FIRST  LAST  ADD  SAVE  DELETE  CANCEL
Unit I


Multiplexing: Many To One/One To Many, Frequency-Division Multiplexing (FDM), Wave-Division Multiplexing (WDM), Time-Division Multiplexing (TDM),

Unit II

Error Detection and Correction: Types of Errors, Detection, Vertical Redundancy Check (VRC), Longitudinal Redundancy Check (LRC), Cyclic Redundancy Check (CRC), Checksum, Error Correction.


Switching: Circuit Switching, Packet Switching, Message Switching.

Unit III

Transport Layer: Duties of the Transport Layer, Connection, the OSI Transport Protocol.

Upper OSI Layers: Session Layer, Presentation Layer, Application Layer.


Text Book:


Books Recommended


Practical: Computer Networks

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Example programs:

Simulation Exercises: The following experiments shall be conducted using either NS2/NS3/OPNET or any other simulators.

1. Simulate a three nodes point-to-point network with duplex links between them. Set the queue size vary the bandwidth and find the number of packets dropped.

2. Simulate a four node point-to-point network, and connect the links as follows: n0– n2, n1-n2 and n2-n3. Apply TCP agent between n0-n3 and UDP n1-n3. Apply relevant applications over TCP and UDP agents changing the parameter and determine the number of packets by TCP/UDP.

3. Simulate the different types of Internet traffic such as FTP a TELNET over a network and analyze the throughput.

4. Simulate the transmission of ping messaged over a network topology consisting of 6 nodes and find the number of packets dropped due to congestion.

5. Simulate an Ethernet LAN using N-nodes (6-10), change error rate and data rate and compare the throughput.

6. Simulate an Ethernet LAN using N nodes and set multiple traffic nodes and determine collision across different nodes.

7. Simulate an Ethernet LAN using N nodes and set multiple traffic nodes and plot congestion window for different source/destination.

8. Simulate simple ESS and with transmitting nodes in wire-less LAN by simulation and determine the performance with respect to transmission of packets.
Elective 1.B: Object Oriented Programming with C++

Unit I
Object-Oriented Paradigm, Data types, Operators and Expressions, Control Flows

Unit II
Arrays and Strings, Modular Programming with Functions, Pointers and runtime Binding, Structures and Unions.

Unit III
Classes and Objects, inheritance, virtual functions, Exception Handling,

Text Book:

Reference:
Practical: Object Oriented Programming with C++

NOTE:

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- External Viva-voce is compulsory.

Example programs:
1) Write a program to test Arithmetic operators.
2) Write a program to Swap two numbers.
3) Write a program to demonstrate Switch statement.
4) Write a program to find roots of a quadratic equation.
5) Write a program to check whether the given number is palindrome or not.
6) Write a program to convert binary number to decimal number.
7) Write a program to print the following format.
   1
   2   3
   4   5   6
   7   8   9   10
8) Write a program to search an element in a given list.
9) Write a program to perform addition of two Matrices.
10) Write a program to perform multiplication of two Matrices.
11) Write a program to find factorial of a given number using recursion.
12) Write a program to demonstrate Pointer arithmetic
13) Write a program to demonstrate Call-By-Value, Call-By-Address, Call-By-Reference.
14) Write a program to demonstrate Structure data type.
15) Write a program to demonstrate Enumerated data type.
16) Write a program to demonstrate inline functions.
17) Write a program to demonstrate Function Overloading.
18) Write a c++ program to demonstrate Class concept.
19) Write a c++ program on Constructor overloading.
20) Write a c++ program on Destructor.
21) Write a c++ program for copy constructor.
22) Write a c++ program to demonstrate Friend function.
23) Write a c++ program for Unary operator overloading (Friend function/Member function).

24) Write a c++ program for Binary operator overloading (Friend function/Member function).

25) Write a c++ program for Member Function overloading within a class

26) Write a c++ program for Single and Multilevel Inheritance.

27) Write a c++ program for Overriding of member functions.

28) Write a c++ program to demonstrate constructor calling mechanism in inheritance.

29) Write a c++ program for Multiple and Hybrid inheritance.

30) Write a c++ program to demonstrate pure virtual function implementation.
Elective 1.C: System Programming

Unit I


Unit II
LEXICAL ANALYSIS: Introduction, Alphabets and Tokens in Computer Languages, Representation of Tokens and Regular Expression, Token Recognition and Finite State Automata, Lexical Analysis Tool

SYNTAX ANALYSIS: Introduction, Context-free Grammar and Structure of Language, Parser and its Types, Top-down Parser, Bottom-up Parser, Parser Generator Tool (Yacc),

Unit III

OPTIMIZATION: Introduction, Hints on Writing Optimized Code at User Level, Construction of Basic Blocks and Processing.


COMPILER WRITING TOOLS: Introduction, Lexical Tools, Syntactic Tools, Test Book:


Reference Books


Practical: Systems Programming

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Example programs:

1. To implement an assembler for a hypothetical language.
2. To get familiar with lex: write a program to recognize numbers, identifiers.
3. To get familiar with yacc: write a desk calculator.
4. Implement a symbol table with functions to create, insert, modify, search, and display.
5. Implement pass one of a two pass assembler.
6. Implement pass two of a two pass assembler.
7. Implement a single pass assembler.
8. Implement a two pass macro processor
9. Implement a single pass macro processor.
10. Implement an absolute loader.
11. Implement a relocating loader.
12. Implement pass one of a direct-linking loader.
13. Implement pass two of a direct-linking loader.
14. Implement a simple text editor with features like insertion / deletion of a character, word, and sentence.
15. Implement a symbol table with suitable hashing.

Unit I


Unit II


Unit III


Two-Dimensional Viewing: The Two-Dimensional Viewing Pipeline, The Clipping Window, Normalization and Viewport Transformations, OpenGL Two-Dimensional Viewing Functions, Clipping Algorithms, Two-Dimensional Point Clipping, Two-Dimensional Line Clipping, Polygon Fill-Area Clipping, Curve Clipping, Text Clipping.

Text Book:


References:


Practical: Computer graphics

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- External Viva-voce is compulsory.

Example programs:

1. Program to recursively subdivide a tetrahedron to from 3D Sierpinski gasket. The number of recursive steps is to be specified by the user.

2. Program to implement Liang-Barsky line clipping algorithm.

3. Program to draw a color cube and spin it using OpenGL transformation matrices.

4. Program to create a house like figure and rotate it about a given fixed point using OpenGL functions.

5. Program to implement the Cohen-Sutherland line-clipping algorithm. Make provision to specify the input line, window for clipping and view port for displaying the clipped image.

6. Program to create a cylinder and a parallel piped by extruding a circle and quadrilateral respectively. Allow the user to specify the circle and quadrilateral.

7. Program using OpenGL functions, to draw a simple shaded scene consisting of a tea pot on a table. Define suitably the position and properties of the light source along with the properties of the surfaces of the solid object used in the scene.

8. Program to draw a color cube and allow the user to move the camera suitably to experiment with perspective viewing. Use OpenGL functions.

9. Program to fill any given polygon using scan-line area filling algorithm. (Use appropriate data structures.)

10. Program to display a set of values \(f_{ij}\) as a rectangular mesh.
Elective 2.B: Software Engineering

Unit I


Unit II


Unit III


SOFTWARE TESTING STRATEGIES: A Strategic Approach to Software Testing, Strategic Issues, integration Testing, Unit Testing, Validation Testing, System Testing,

Text book:

Practical: Software Engineering

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- External Viva-voce is compulsory.

Example programs:

Practical exercises based on concepts listed in Software Testing theory.

1. Write a program that take three inputs \(a, b \& c\) that represent the sides of a triangle, and the output is one of the below four:
   
   a. Not a triangle
   b. Scalene triangle
   c. Isosceles triangle
   d. Equilateral triangle

   1.1 Generate test cases using Boundary Value Analysis, Equivalence Class Partitioning and Decision Table Testing.
   1.2 Generate test cases using Basis path testing.
   1.3 Run code coverage tool.

2. Write a program that determines the nature of roots of a quadratic equation. Output should be one of the following:-
   
   - Not a quadratic equation.
   - Complex roots
   - Real roots
   - Single roots

   I. Generate test cases using Boundary Value Analysis, Equivalence Class Partitioning and Decision Table Testing.
   II. Generate test cases using Basis path testing.
   III. Run code coverage tool

3. Write a program that checks whether the number is even or odd. Run code coverage tool and find the amount of code being covered.

4. Write a program that dynamically allocates memory to 10 integers using `malloc()` or `calloc()` and
   
   - donot free memory leading to memory leaks. Verify the same using Valgrind.
   - Now, free memory using `free()` at the end of the program to avoid memory leaks. Verify the same using Valgrind.
Elective 2.C: PHP Programming

Unit I
Introducing PHP: History, Unique Features, Basic Development Concepts, Creating Your First PHP Script, Mixing PHP with HTML, Sample Applications.
Using Variables and Operators: Storing Data in Variables, Understanding PHP's Data Types, Setting and Checking Variable Data Types, Using Constants, Manipulating Variables with Operators.

Unit II

Unit III

Text book:

Reference Books:
2. Timothy Boronczyk, Martin E. Psinas, "PHP and MYSQL (Create-Modify-Reuse)", Wiley India Private Limited, 2008.
NOTE:

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- In the external lab examination student has to execute at least three programs with compilation and deployment steps are necessary.
- External Viva-voce is compulsory.

Example programs:

1. Create a PHP page using functions for comparing three integers and print the largest number.
2. Write a function to calculate the factorial of a number (non-negative integer). The function accept the number as an argument.
3. WAP to check whether the given number is prime or not.
4. Create a PHP page which accepts string from user. After submission that page displays the reverse of provided string.
5. Write a PHP function that checks if a string is all lower case.
6. Write a PHP script that checks whether a passed string is palindrome or not? (A palindrome is word, phrase, or sequence that reads the same backward as forward, e.g., madam or nurses run)
7. WAP to sort an array.
8. Write a PHP script that removes the whitespaces from a string. Sample string: 'The quick brown fox' Expected Output: Thequickbrownfox
9. Write a PHP script that finds out the sum of first n odd numbers.
10. Create a login page having user name and password. On clicking submit, a welcome message should be displayed if the user is already registered (i.e. name is present in the database) otherwise error message should be displayed.
11. Write a PHP script that checks if a string contains another string.
12. Create a simple 'birthday countdown' script, the script will count the number of days between current day and birth day.
13. Write a simple PHP program to check that emails are valid.
14. WAP to print first n even numbers.
15. Write a PHP program to print Fibonacci series using recursion.
16. Write a PHP script to replace the first 'the' of the following string with 'That'.
17. Using switch case and dropdown list display a —Hello! message depending on the language selected in drop down list.
18. Create a script to construct the following pattern, using nested for loop.

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