Bachelor of Computer Application (BCA) Syllabus

Under the

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

DEPARTMENT OF COMPUTER SCIENCE
University College, KU, Warangal-506009
### BCA I YEAR I SEMESTER

<table>
<thead>
<tr>
<th>Code</th>
<th>Subject</th>
<th>Workload Per Week</th>
<th>Marks</th>
<th>Credit</th>
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### BCA I YEAR II SEMESTER

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## BCA II YEAR I SEMESTER

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| **Total credits** | 24 |

## BCA II YEAR II SEMESTER

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| **Total credits** | 24 |
### BCA III YEAR I SEMESTER

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### GENERAL ENGLISH I

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<td>DECISION-MAKING SKILL</td>
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FUNDAMENTALS OF INFORMATION TECHNOLOGY

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

Signature, Firewal, Users Identification and Authentication, Other Security Measures, Security Awareness, Security Policy.


Text Books:


References:

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 Multi-function Program, Elements of user-defined Functions, Definition of Functions, Return Values 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


Text Book:


References:

DISCRETE MATHEMATICS

UNIT I
Sets, relations and functions, problem solving strategies, fundamentals of logic, logical inferences, first order logic, mathematical induction.

UNIT II
Elementary Combinations: Combinations and permutations, enumerations with repetitions, with constrained repetitions, Principle of Inclusion-Exclusion.

UNIT III

Unit IV
Boolean algebra: Introduction to Boolean Algebra Functions, Switching Mechanisms, Minimization of Boolean Functions, Applications to Boolean Design, Finite State Diagrams

TEXT BOOKS:
1. Discrete Mathematics For Computer Scientist And Mathematicians By Joe L.Mott, Abraham Kandel, Theodore P.Baker

References:
1. Discrete Mathematics By Trembely And Manohar. (Tmh)
2. Discrete Mathematics By Bernord Kolnan, Robert C.Busby And Sharon Ross (Phi Third Edition)
MANAGEMENT INFORMATION SYSTEM

UNIT I

UNIT II
Structure of Information System - Information System for Strategic Planning - Management Control and Operational Control - Applications of Tactical And Strategic Information System to Accounting and Finance, Marketing Production And Human Resources.

UNIT III

UNIT IV
Planning and Developing Information Systems -MIS Planning Approaches - Internal Problems Related to MIS - Pit Falls in MIS Development - Organization for MIS - Centralization vs Decentralization.

REFERENCE BOOKS:

PRACTICAL: FUNDAMENTALS OF INFORMATION TECHNOLOGY

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>Truck</th>
<th>Puzzles</th>
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<td>York, George</td>
<td>2190</td>
<td>1278</td>
<td>1928</td>
</tr>
<tr>
<td>Banks, Jennifer</td>
<td>1201</td>
<td>2528</td>
<td>1203</td>
</tr>
<tr>
<td>Atwater, Kelly</td>
<td>4098</td>
<td>3079</td>
<td>2067</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
FORMAT 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>1100</td>
<td>1300</td>
<td>1500</td>
<td>1400</td>
<td></td>
<td>20</td>
<td></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:

   i. Title in TIMES NEW ROMAN
   ii. Font Size - 14
   iii. 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>Roll No.</th>
<th>Name</th>
<th>Marks</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1001</td>
<td>Sachin</td>
<td>99</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1002</td>
<td>Sehwag</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1003</td>
<td>Rahul</td>
<td>41</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1004</td>
<td>Sourav</td>
<td>89</td>
<td></td>
</tr>
<tr>
<td>5</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:

<table>
<thead>
<tr>
<th>Marks</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;= 80</td>
<td>A+</td>
</tr>
<tr>
<td>10&gt;= 60 &lt; 80</td>
<td>A</td>
</tr>
<tr>
<td>&gt;= 50 &lt; 60</td>
<td>B</td>
</tr>
<tr>
<td>&lt; 50</td>
<td>F</td>
</tr>
</tbody>
</table>

3. Given the following worksheet

<table>
<thead>
<tr>
<th></th>
<th>Salesman</th>
<th>Sales in (Rs.)</th>
<th>Qtr1</th>
<th>Qtr2</th>
<th>Qtr3</th>
<th>Qtr4</th>
<th>Total Commission</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>S001</td>
<td>5000</td>
<td>8500</td>
<td>12000</td>
<td>9000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>S002</td>
<td>7000</td>
<td>4000</td>
<td>7500</td>
<td>11000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>S003</td>
<td>4000</td>
<td>9000</td>
<td>6500</td>
<td>8200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>S004</td>
<td>5500</td>
<td>6900</td>
<td>4500</td>
<td>9500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>S005</td>
<td>7400</td>
<td>8500</td>
<td>9200</td>
<td>8300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</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 guidelines:

<table>
<thead>
<tr>
<th>Total Sales</th>
<th>Commission</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 20000</td>
<td>0% of sales</td>
</tr>
<tr>
<td>&gt; 20000 and &lt; 25000</td>
<td>4% of sales</td>
</tr>
<tr>
<td>&gt; 25000 and &lt; 30000</td>
<td>5.5% of sales</td>
</tr>
<tr>
<td>&gt; 30000 and &lt; 35000</td>
<td>8% of sales</td>
</tr>
<tr>
<td>&gt;= 35000</td>
<td>11% of sales</td>
</tr>
</tbody>
</table>

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

| Rate of Interest | 8% |
| Time            | 5 Years |
| Principal       | Simple Interest |
| 1000            | ? |
| 18000           | ? |
| 5200            | ? |

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>
</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 QUARTER</th>
<th>JAN</th>
<th>FEB</th>
<th>MARCH</th>
<th>QUARTER TOTAL</th>
<th>QUARTER AVERAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rent</td>
<td>600.00</td>
<td>600.00</td>
<td>600.00</td>
<td>600.00</td>
<td></td>
</tr>
<tr>
<td>Telephone</td>
<td>48.25</td>
<td>43.50</td>
<td>60.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Utilities</td>
<td>67.27</td>
<td>110.00</td>
<td>70.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Credit Card</td>
<td>200.00</td>
<td>110.00</td>
<td>70.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil</td>
<td>100.00</td>
<td>150.00</td>
<td>90.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AV to Insurance</td>
<td>150.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cable TV</td>
<td>40.75</td>
<td>40.75</td>
<td>40.75</td>
<td>40.75</td>
<td></td>
</tr>
</tbody>
</table>

   **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

**TOTAL REVENUE EARNED FOR SAM'S BOOKSTALL**

<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>Rs. 800.00</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>Rs. 2,000.00</td>
<td></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>Rs.560.00</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.
(b) 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
PRACTICAL: 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. $1+x^2/2!+x^4/4!+...$upto 5 terms
   b. $x+x^3/3!+x^5/5!+...$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
<table>
<thead>
<tr>
<th>Code</th>
<th>Subject</th>
<th>Workload Per Week</th>
<th>Marks</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>External</td>
<td>Internal</td>
</tr>
<tr>
<td>BCA21</td>
<td>General English - II</td>
<td>T (4)</td>
<td>70</td>
<td>30</td>
</tr>
<tr>
<td>BCA22</td>
<td>Object Oriented Programming With C++</td>
<td>T (4)</td>
<td>70</td>
<td>30</td>
</tr>
<tr>
<td>BCA23</td>
<td>Probability And Statistics</td>
<td>T (4)</td>
<td>70</td>
<td>30</td>
</tr>
<tr>
<td>BCA24</td>
<td>Operating System</td>
<td>T (4)</td>
<td>70</td>
<td>30</td>
</tr>
<tr>
<td>BCA25</td>
<td>Computer Organization</td>
<td>T (4)</td>
<td>70</td>
<td>30</td>
</tr>
<tr>
<td>BCA26</td>
<td>Object Oriented Programming With C++ Lab</td>
<td>L (4)</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td>BCA27</td>
<td>Operating system - lab</td>
<td>L (4)</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total credits</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## GENERAL ENGLISH II

<table>
<thead>
<tr>
<th>LESSON FIVE (SHORT FICTION)</th>
<th>TEXT</th>
<th>THE RELUCTANT PHILANTHROPIST by GOLLAPOODI SRINIVASA RAO</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRONUNCIATION</td>
<td></td>
<td>FRICTIONES</td>
</tr>
<tr>
<td>GRAMMAR</td>
<td></td>
<td>DISCOURSE MARKERS</td>
</tr>
<tr>
<td>VOCABULARY</td>
<td></td>
<td>IDIOMS &amp; PHRASES</td>
</tr>
<tr>
<td>SPELLING</td>
<td></td>
<td>USE OF 'TE' AND 'EI'</td>
</tr>
<tr>
<td>CONVERSATIONS</td>
<td></td>
<td>SEEKING INFORMATION</td>
</tr>
<tr>
<td>READING</td>
<td></td>
<td>BATHUKAMMA</td>
</tr>
<tr>
<td>LIFE SKILLS</td>
<td></td>
<td>PROBLEM-SOLVING SKILL</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LESSON SIX (PROSE)</th>
<th>TEXT</th>
<th>HOW SHOULD ONE READ A BOOK BY VIRGINIA WOOLF</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRONUNCIATION</td>
<td></td>
<td>AFFRICATES &amp; NASALS</td>
</tr>
<tr>
<td>GRAMMAR</td>
<td></td>
<td>VOICE &amp; DEGREES OF</td>
</tr>
<tr>
<td>VOCABULARY</td>
<td></td>
<td>PHRASAL VERBS</td>
</tr>
<tr>
<td>SPELLING</td>
<td></td>
<td>USE OF 'ABLE' &amp; 'IBLE'</td>
</tr>
<tr>
<td>CONVERSATIONS</td>
<td></td>
<td>ORGANIZING A MEETING/INVITING</td>
</tr>
<tr>
<td>READING</td>
<td></td>
<td>RAMAPPA</td>
</tr>
<tr>
<td>LIFE SKILLS</td>
<td></td>
<td>EFFECTIVE COMMUNICATION SKILL</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LESSON SEVEN (POETRY)</th>
<th>TEXT</th>
<th>AFTER BLENHEIM by ROBERT SOUTHEY</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRONUNCIATION</td>
<td></td>
<td>LATERALS, SEMI-VOWELS</td>
</tr>
<tr>
<td>GRAMMAR</td>
<td></td>
<td>REPORTING SPEECH &amp; QUESTION</td>
</tr>
<tr>
<td>VOCABULARY</td>
<td></td>
<td>LEXIS/WORD-BUILDING</td>
</tr>
<tr>
<td>SPELLING</td>
<td></td>
<td>USE OF PREFIXES &amp; SUFFIXES</td>
</tr>
<tr>
<td>CONVERSATIONS</td>
<td></td>
<td>ORGANIZING A MEETING/PROPOSING A VOTE OF THANKS</td>
</tr>
<tr>
<td>READING</td>
<td></td>
<td>BONALU</td>
</tr>
<tr>
<td>LIFE SKILLS</td>
<td></td>
<td>INTER-PERSONAL RELATIONSHIPS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LESSON EIGHT (DRAMA)</th>
<th>TEXT</th>
<th>THE INFORMER by BERTOLT BRECHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRONUNCIATION</td>
<td></td>
<td>SYLLABIC STRUCTURE</td>
</tr>
<tr>
<td>GRAMMAR</td>
<td></td>
<td>COMMON ERRORS</td>
</tr>
<tr>
<td>VOCABULARY</td>
<td></td>
<td>COLLOCATIONS</td>
</tr>
<tr>
<td>SPELLING</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CONVERSATIONS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>READING</td>
<td></td>
<td>KINNERASANI</td>
</tr>
<tr>
<td>LIFE SKILLS</td>
<td></td>
<td>COPING WITH STRESS AND</td>
</tr>
</tbody>
</table>
OBJECT ORIENTED PROGRAMMING WITH C++

Unit I

Algorithm and its characteristics, pseudo code / flow chart, program.


Basics of C++ Programming: Introduction, History, Structure, Writing the First C++ Program, Files used in a C++ Program, Compiling and Executing, Using Comments, Tokens, Characters Set, Keywords, Identifier, Data Types, Variables, Constants, Input and Output, Statements, Operators, Type Conversion and Type Casting,


Unit II

Functions: Introduction, Need for Functions, Using Functions, Function Declaration or function, Prototype, Function Definition, Function Call, Return Statement, Passing Parameters to the Function, Default Arguments, Return by Reference, Passing Constants as Arguments, Variables Scope, Storage Classes, Inline Functions, Function Overloading, Recursive Functions, Recursion Versus Iteration, Function with Variable Number of Arguments

Arrays: Introduction, Declaration of Arrays, Accessing Elements of the Array, Storing Values in Arrays, Calculating the Length of Array, Operations that can be Performed on Arrays, One Dimensional Arrays for Inter Function Communication, Two Dimensional Arrays, Multi Dimensional Arrays,

Pointers: Defining Pointers, Declaring Pointer Variables, Pointer Expressions and Pointer Arithmetic, Null Pointers, Generic Pointers, Passing Arguments to Function Using Pointer, Pointer and Arrays, Passing Array to Function, Differences Between Array Name and Pointer, Pointer to function, Arrays of Function Pointers, Memory Allocation in C++, Dynamic Memory Allocation,

Unit III

Structure, Union, and Enumerated Data Types: Structure Declaration, Typedef Declaration, Initialization the Structures, Accessing the Members of a Structures, Union, Union Inside Structures, Enumerated Data Types

Classes and Objects : Specifying a Class, Creating Objects, Accessing Object Members, Nested Member Functions, Making a Memory Function Inline, Memory Allocation for Class and Objects, Returning Objects, this Pointer, Constant Parameters and Members, Pointers within a Class, Local Classes, Nested Classes in C++, Empty Classes, Friend Function, Friend Class, Bit-Field in Classes, Pointers and Class Members.

Constructors and Destructors: Constructor, Types of Constructors, Constructor with Default Arguments, Constructor Overloading, Destructors.
Unit IV

Operator overloading and Type Conversions: Scope of Operator Overloading, Syntax for Operator Overloading, Operators that can and cannot be Overloaded, Implementing Operator Overloading, Overloading Unary Operators, Overloading Binary Operators, Overloading Special Operators, Type Conversions.

Inheritance and Run-Time Polymorphism: Defining Derived Classes, Access Specifiers, Type of Inheritance, Single Inheritance, Constructors and Destructors in Derived Classes, Multi level Inheritance, Constructor in Multi Level Inheritance, Multiple Inheritance, Constructor and Destructor in Multiple Inheritance, Ambiguity in Multiple Inheritance, Hierarchical Inheritance, Constructors and Destructors in Hierarchical Inheritance, Hybrid Inheritance, Multi-path Inheritance, Virtual Base Classes, Object Slicing, Pointer to Derived Class, Run time Polymorphism, Virtual Functions, Pure Virtual Functions, Abstract Base Classes, Concept of Vtables, Virtual Constructor and Destructor.

Templates: Introduction, Use of templates, Function templates, Class templates.

Text Book:


Recommended Books

2. Richard Johnson, An Introduction to Object-Oriented Application Development, Thomson Learning, 2006
PROBABILITY AND STATISTICS

UNIT I
Introduction to Statistics: Data Collection and Tabulation, Graphical Representation of Data
Measures of Central Tendency and Dispersion, Moments, Skewness and Kurtosis.

Unit II
Probability: Introduction to Probability, Mutually Exclusive and Independent Events,
Dependent Events and Conditional Probability. Addition and multiplication theorem of probability

UNIT III
Discrete Probability Distributions: Binomial Distribution, The Hyper Geometric

Unit IV
The Normal Distribution: Introduction to the Normal Distribution, Applications of
The Normal Distribution, The Normal Approximation to the Binomial Distribution.

TEXT BOOKS:
2. Theory And Problems Pf Probability By Seymour Lipschutz(Schaum Series Tmh)
OPERATING SYSTEMS

Unit I


Unit II


Unit III


Unit IV

Text book:

Recommended Books
COMPUTER ORGANIZATION

UNIT I
Introduction Logic gates and circuits: Gates (OR, AND, NOR, NAND, XOR & XNOR); Demogran’s laws; Boolean laws, Circuit designing techniques (SOP, POS, K-Map).

Data representation: Representation of Number, Binary, Octal, Hexadecimal number and its Arithmetic, Representation of Integers, Representation of Fractions, Representation of Character, Characters codes (ASCII), Binary Multiplication Division, Conversation of number in Decimal, Binary, Octal, and Hexadecimal.

UNIT II
Instructions and Flow of Control: Instruction formats, Types of Instruction, Types of operands, Addressing modes & Their Importance, Flow of Control.

UNIT III
Processing Unit and Processors: Instruction Execution and Parallel Instruction Execution, CPU organization. Processors: RISC vs CISC, The Motorola 680X0 Family, The Intel 80X86 Family, The Power PC Family

UNIT IV
Computer Memory and Buses: Introduction to Computer Memory, RAM, ROM, Types of RAM and ROM, Memory Hierarchical structure, Cache Memory and Virtual Memory, Introduction to buses, Types of buses.

Text Book:

REFERENCE BOOKS:
1. Computer Organization, (Phi) By Moris Mano
2. Computer Architecture & Organisation By Hayes, (Tmh)
4. The Architecture Of Computer Hardware And Sytems Hardware By I Englander (Wiley)
5. Computer Sytems Design And Architecture By Vp Heuring, Hf Jordan (Pearson)
PRACTICAL: OBJECT ORIENTED 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 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.
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. Simulate the following CPU Scheduling algorithms a) Round Robin b) SJF c) FCFS d) Priority
2. Simulate all file allocation strategies. a) Sequential b) Indexed c) Linked
3. Simulate MVT and MFT
4. Simulate all File organization techniques. a) Single level directory b) Two level c) Hierarchical d) DAG
6. Simulate all Page replacement algorithms. a) FIFO b) LRU c) LFU d) Etc.…
7. Simulate Paging Techniques of memory management.
## BCA II YEAR I SEMESTER

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DATA STRUCTURES WITH C++

Unit I

Basic data Structure: Introduction to Data Structures, Types of Data Structures, and Introduction to Algorithms, Pseudocode, and Relationship among data, data structures, and algorithms, Implementation of data structures, Analysis of Algorithms.

Stacks: Concept of Stacks and Queues, Stacks, Stack Abstract Data Type, Representation of Stacks Using Sequential Organization (Arrays), Multiple Stacks, Applications of Stack, Expression Evaluation and Conversion, Polish notation and expression conversion, Processing of Function Calls, Reversing a String with a Stack, Recursion.

Memory Management: Garbage collection algorithms for equal sized blocks, storage allocation for objects with mixed size, buddy systems

Unit II

Recursion: Introduction, Recurrence, Use of Stack in Recursion, Variants of Recursion, Recursive Functions, Iteration versus Recursion.

Queues: Concept of Queues, Queue as Abstract Data Type, Realization of Queues Using Arrays, Circular Queue, Multi-queues, Deque, Priority Queue, Applications of Queues,


Unit III

Trees: Introduction, Types of Trees, Binary Tree, Binary Tree Abstract Data Type, Realization of a Binary Tree, Insertion of a Node in Binary Tree, Binary Tree Traversal, Other Tree Operations, Binary Search Tree, Threaded Binary Tree, Applications of Binary Trees.

Searching and Sorting: Searching, Search Techniques, Sorting, Multiway Merge and Polyphase Merge, Comparison of All Sorting Methods, Search Trees: Symbol Table, Optimal Binary Search Tree, AVL Tree (Height-balanced Tree).

Unit IV

Hashing: Introduction, Key Terms and Issues, Hash Functions, Collision Resolution Strategies, Hash Table Overflow, Extendible Hashing, Dictionary, Skip List, Comparison of Hashing and Skip Lists.

Heaps: Basic Concepts, Implementation of Heap, Heap as Abstract Data Type, Heap Applications,

Text books:


Recommended Books


OPERATION RESEARCH

UNIT I

UNIT II
Transportation Problem: Principle of duality in linear programming problem, Dual simplex method. Transportation Problem, Initial Basic Feasible Solution by N-W corner rule, matrix minima method, Vogel’s approximation method, optimal transportation solution, Balanced and unbalanced degenerate cases.

UNIT III
Assignment Problem: Definition and application of assignment problem, Hungarian Assignment Algorithm, unbalanced assignment problem, maximization case in assignment problem.

UNIT IV
Queuing Models: Concepts, applicability, classification, exponential distribution, Birth and Death process, poisson queues, single server, multiple server queuing models.

TEXT BOOKS:

REFERENCE BOOKS:
1. Operations Research By P.K. Guptha, Manmohan,S.Chand & Company, Delhi-6
WEB PROGRAMMING

Unit – I


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.

Unit - III

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

Unit IV

JavaScript: Arrays, JavaScript: 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.

Text Book:

SOFTWARE ENGINEERING

Unit I

UNIT II

Requirements Engineering Process: Feasibility Study, Requirements Elicitation and Analysis, Requirements Validation, Requirements Management.

UNIT III


UNIT IV


Text books:
1. Software Engineering, A Practitioner's Approach- Roger S. Pressman,
2. Software Engineering- Somerville, Pearson Education
COMPUTER NETWORKS

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.

Unit III
Switching: Circuit Switching, Packet Switching, Message Switching.

UNIT IV
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: DATA STRUCTURES WITH C++

NOTE:
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- External Viva-voce is compulsory.

Example programs:
1. Write C++ programs to implement the following using an array
   a) Stack ADT
   b) Queue ADT
2. Write a C++ program to implement Circular queue using array.
3. Write C++ programs to implement the following using a single linked list.
   a) Stack ADT
   b) Queue ADT
4. Write a C++ program to implement Circular queue using Single linked list.
5. Write a C++ program to implement the double ended queue ADT using double linked list.
6. Write a C++ program to solve tower of hanoi problem recursively
7. Write C++ program to perform the following operations:
   a) Insert an element into a binary search tree.
   b) Delete an element from binary search tree.
   c) Search for a key in a binary search tree.
8. Write C++ programs for the implementation of BFS and DFS.
9. Write a C++ program that uses non-recursive functions to traverse a binary tree.
   a) Pre-order
   b) In-order
   c) Post-order
10. Write a C++ program to find height of a tree.
11. Write a C++ program to find MIN and MAX element of a BST.
12. Write a C++ program to find Inorder Successor of a given node.
13. Write C++ programs to perform the following operations on B-Trees and AVL Trees.
   a) Insertion   b) Deletion
14. Write C++ programs for sorting a given list of elements in ascending order using the following sorting methods.
   a) Quick sort
   b) Merge sort

15. Write a C++ program to find optimal ordering of matrix multiplication.

16. Write a C++ program that uses dynamic programming algorithm to solve the optimal binary search tree problem.

17. Write a C++ program to implement Hash Table.

18. Write C++ programs to perform the following on Heap
   a) Build Heap
   b) Insertion
   c) Deletion

19. Write C++ programs to perform following operations on Skip List
   a) Insertion
   b) Deletion

20. Write a C++ program to Heap sort using tree structure.
PRACTICAL: WEB PROGRAMMING

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:

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>Some image here</th>
</tr>
</thead>
<tbody>
<tr>
<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>Department1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department1</td>
</tr>
<tr>
<td>Department1</td>
</tr>
</tbody>
</table>

   About department

   | Department1 | This frame would show the contents according to the link clicked by the user on the left Frame. |

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:

<table>
<thead>
<tr>
<th>Frame1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frame2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>frame1</th>
</tr>
</thead>
<tbody>
<tr>
<td>frame2</td>
</tr>
</tbody>
</table>
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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- [ ] Here on the Web
- [ ] In a magazine
- [ ] Television
- [ ] Other

Would you like to be on our regular mailing list?
- [ ] Yes, we love junk emails

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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.
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DESIGN AND ANALYSIS OF ALGORITHMS

Unit I


Dynamic Programming: Rod cutting, Matrix-chain multiplication, Elements of dynamic programming, longest common subsequence, Optimal binary search trees.


Unit II

Searching and Sorting Techniques: Review of elementary sorting techniques – selection sort, Bubble sort, insertion sort, more sorting techniques – quick sort, heap sort, merge sort, shell sort, external sorting.

Limitations of Algorithm: Lower-Bound Arguments, Decision Trees, \( P \), \( NP \), and \( NP \)-Complete Problems.

Polynomials and the FFT: Representing polynomials, The DFT and FFT, Efficient FFT implementations.

Number-Theoretic Algorithms: Elementary number-theoretic notions, Greatest common divisor(GCD), Modular arithmetic, Addition and Multiplication of two large numbers.

Unit III


NP-Completeness: Polynomial time, Polynomial-time verification, NP-completeness and reducibility, NP-completeness proofs, NP-complete problems.


Unit IV

Elementary Graph Algorithms: Representations of graphs, Breadth-first search, Depth-first search, Topological sort, strongly connected components.

Minimum Spanning Trees: Growing a minimum spanning tree, the algorithms of Kruskal and Prim.


Text book:


References:


DATABASE MANAGEMENT SYSTEM

Unit I


Unit II


Unit III


Introduction to SQL: Overview of the SQL Query Language, SQL Data Definition, Basic Structure of SQL Queries, Additional Basic Operations, Set Operations, Null Values, Aggregate Functions, Nested Subqueries, Modification of the Database.

Unit IV

Intermediate SQL: Join Expressions, Views, Transactions, Integrity Constraints, SQL Data Types and Schemas, Authorization.

Advanced SQL: Accessing SQL From a Programming Language, Functions and Procedures, Triggers, Recursive Queries.

Text book:


References:


JAVA PROGRAMMING

Unit 1
Introduction to Java: Features of Java, JDK Environment
Object Oriented Programming Concept: Overview of Programming, Paradigm, Classes, Abstraction, Encapsulation, Inheritance, Polymorphism, Difference between C++ and JAVA

Unit II
Java Programming Fundamental :Structure of java program, Data types, Variables, Operators, Keywords, Naming Convention, Decision Making (if, switch),Looping(for, while) ,Type Casting
Classes and Objects: Creating Classes and objects, Memory allocation for objects, Constructor, Implementation of Inheritance, Implementation of Polymorphism, Method Overloading, Method Overriding, Nested and Inner classes

Unit III
Arrays and Strings: Arrays, Creating an array, Types of Arrays, String class Methods, String Buffer methods.
Abstract Class, Interface and Packages: Modifiers and Access Control, Abstract classes and methods, Interfaces, Packages Concept, Creating user defined packages

Unit IV
Exception Handling: Exception types, Using try catch and multiple catch, Nested try, throw throws and finally, Creating User defined Exceptions.
File Handling: Byte Stream, Character Stream, File IO Basics, File Operations, Creating file, Reading file, Writing File
Applet Programming: Introduction, Types Applet, Applet Life cycle, Creating Applet, Applet tag

Books Recommended:
SYSTEM APPROACH TO MANAGEMENT

UNIT I

UNIT II

UNIT III

UNIT IV

BOOKS:
Unit I


Unit II


Unit III


Two-Dimensional Geometric Transformations: Basic Two-Dimensional Geometric Transformations, Matrix Representations, Inverse Transformations, Two-Dimensional Composite Transformations, Raster Methods for Geometric Transformations, OpenGL Raster Transformations, Transformations between

Unit IV

Two-Dimensional Coordinate Systems, OpenGL Functions for Two-Dimensional Geometric Transformations.

Two-Dimensional Viewing: The Two-Dimensional Viewing Pipeline, The ClippingWindow, 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:


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:

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.
   e) 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 )**

a) Identify primary and foreign keys.
b) Alter table employee, add a column “email” of type varchar(20).
c) Find the name of all managers who work for both Samba Bank and NCB Bank.
d) 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.
e) Find the names of all employees who live in the same city as the company for which they work.
f) Find the highest salary, lowest salary and average salary paid by each company.
g) Find the sum of salary and number of employees in each company.
h) 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).
PRACTICAL: JAVA PROGRAMMING

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. WAP to find the largest of n natural numbers.
2. WAP to find whether a given number is prime or not.
3. Write a menu driven program for following:
   a. Display a Fibonacci series
   b. Compute Factorial of a number
   c. WAP to check whether a given number is odd or even.
   d. WAP to check whether a given string is palindrome or not.
4. WAP to print the sum and product of digits of an Integer and reverse the Integer.
5. Write a program to create an array of 10 integers. Accept values from the user in that array. Input another number from the user and find out how many numbers are equal to the number passed, how many are greater and how many are less than the number passed.
6. Write a program that will prompt the user for a list of 5 prices. Compute the average of the prices and find out all the prices that are higher than the calculated average.
7. Write a program in java to input N numbers in an array and print out the Armstrong numbers from the set.
8. Write java program for the following matrix operations:
   a. Addition of two matrices
   b. Summation of two matrices
   c. Transpose of a matrix
   d. Input the elements of matrices from user.
9. Write a java program that computes the area of a circle, rectangle and a Cylinder using function overloading.
10. Write a Java for the implementation of Multiple inheritance using interfaces to calculate the area of a rectangle and triangle.
11. Write a java program to create a frame window in an Applet. Display your name, address and qualification in the frame window.
12. Write a java program to draw a line between two coordinates in a window.
13. Write a java program to display the following graphics in an applet window.
   a. Rectangles
   b. Circles
   c. Ellipses
   d. Arcs
   e. Polygons
14. Write a program that reads two integer numbers for the variables a and b. If any other character except number (0-9) is entered then the error is caught by NumberFormatException object. After that ex.getMessage() prints the information about the error occurring causes.
15. Write a program for the following string operations:
   a. Compare two strings
   b. Concatenate two strings
   c. Compute length of a string
16. Create a class called Fraction that can be used to represent the ratio of two integers. Include appropriate constructors and methods. If the denominator becomes zero, throw and handle an exception.
## BCA III YEAR I SEMESTER

<table>
<thead>
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<tr>
<td>BCA51</td>
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<td>T (4)</td>
<td>70</td>
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<td>Object Oriented Design in UML</td>
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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


Unit IV
The Internet and Multimedia: Internet History, Internetworking, Multimedia on the Web.


Text book:

Reference books:
4. Spoken Tutorial on “GIMP”as E-resource for Learning:-http://spoken-tutorial.org
5. Spoken Tutorial on “Blender” as E-resource for Learning:-http://spoken-tutorial.org
OBJECT ORIENTED DESIGN IN UML

UNIT - I

Introduction to UML: Importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML, Architecture, Software Development Life Cycle.

Unit II

Basic Structural Modeling: Classes, Relationships, common Mechanisms, and diagrams.

Advanced Structural Modeling: Advanced classes, advanced relationships, Interfaces, Types and Roles, Packages.

UNIT - III

Class & Object Diagrams: Terms, concepts, modeling techniques for Class & Object Diagrams.


UNIT-IV

Basic Behavioral Modeling-II: Use cases, Use case Diagrams, Activity Diagrams.

Case Study: The Unified Library application

TEXT BOOKS

2. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado: UML 2 Toolkit, WILEY-Dreamtech India Pvt. Ltd.

REFERENCES

Unit – I


Introduction to Problem Solving and Control Statements: Introduction, Algorithms, Pseudocode Algorithm, Control Structures, If ... Then Selection Statement, If ... Then Else Selection Statement, Nested If ... Then ... Else Selection Statements, Using the Debugger: Locating a Logic Error.

Unit – II

Problem Solving and Control Statements: Introduction, For ... Next Repetition Statement, Examples Using the For ... Next Statement, Nested Repetition Statements, Select ... Case Multiple-Selection Statement, Do ... Loop While and Do ... Loop Until Repetition Statements, Using Exit to Terminate Repetition Statements, Using Continue in Repetition Statements, Logical Operators,


Arrays: Introduction, Arrays, Declaring and Allocating Arrays, Initializing the Values in an Array, Summing the Elements of an Array, Passing an Array to a Method, For Each ... Next Repetition Statement, Rectangular Arrays, Resizing an Array with the ReDim Statement.

Unit – III

Windows Forms GUI: A Deeper Look: Introduction, Controls and Components, Creating Event Handlers, Control Properties and Layout, GroupBoxes and Panels, ToolTips, Mouse-Event Handling, Keyboard-Event Handling, Menus, MonthCalendar Control, DateTimePicker Control, LinkLabel Control, ListBox and CheckedListBox Controls, Multiple Document Interface (MDI) Windows, Visual Inheritance, Animation with the Timer Component. Exception Handling: A Deeper Look (Appendix)

Object-Oriented Programming - Classes and Objects: Introduction, Classes, Objects, Methods and Instance Variables, Account Class, Value Types and Reference Types, Class Scope, Object Initializers, Auto-Implemented Properties, Using Me to Access the Current Object, Garbage Collection, Shared Class Members, Const and ReadOnly Fields, Shared Methods and Class Math, Object Browser.
Unit – IV

Object-Oriented Programming - Inheritance and Polymorphism: Introduction, Base Classes and Derived Classes, Class Hierarchy, Constructors in Derived Classes, Protected Members, Introduction to Polymorphism - A Polymorphic Video Game, Abstract Classes and Methods,

Databases and LINQ: Introduction, Relational Databases, A Books Database, LINQ to Entities and the ADO.NET Entity Framework, Querying a Database with LINQ, Dynamically Binding Query Results, Retrieving Data from Multiple Tables with LINQ, Creating a Master/Detail View App.

Text Books:

E-COMMERCE TECHNOLOGIES

Unit I

Unit II
The Internet and WWW: Evolution of Internet, Domain Names and Internet Organization (.edu, .com, .mil, .gov, .net etc.) , Types of Network, Internet Service Provider, World Wide Web, Internet & Extranet, Role of Internet in B2B Application, building own website, Cost, Time, Reach, Registering a Domain Name, Web promotion, Target email, Baner, Exchange, Shopping Bots

Unit III

Unit IV
Planning for Electronic Commerce: Planning Electronic Commerce initiates, Linking objectives to business strategies, Measuring cost objectives, Comparing benefits to Costs, Strategies for developing electronic commerce web sites
Internet Marketing: The PROS and CONS of online shopping, The cons of online shopping, Justify an Internet business, Internet marketing techniques, The E-cycle of Internet marketing, Personalization e-commerce.

Books Recommended:
CRYPTOGRAPHY AND NETWORK SECURITY

Unit I


Unit II


Unit III

Public-Key Cryptography and RSA: Principles of Public-Key Cryptosystems, the RSA Algorithm,


Unit IV


Text book:


Book Recommended


PRACTICAL: MULTIMEDIA SYSTEMS AND APPLICATIONS

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:

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, pe, 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).
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. 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:

Employee Form

Employee Name: 
Employee Id: 
Date of Joining: 
Designation: 
Department: 
Address: 
Basic Pay: 

PREV NEXT FIRST LAST ADD SAVE DELETE CANCEL
## BCA III YEAR II SEMESTER

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<tr>
<td></td>
<td>A1 Artificial Intelligence</td>
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<td>B1 Theory of Computation</td>
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<td>C1 Digital Image Processing</td>
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<td>A2 Data mining</td>
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<td></td>
<td>B2 Android Programming</td>
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<td>C2 Unix programming</td>
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Elective A1: ARTIFICIAL INTELLIGENCE

Unit I
Introduction: Introduction to Artificial Intelligence, Background and Applications, Turing Test and Rational Agent approaches to AI, Introduction to Intelligent Agents, their structure, behavior and environment.

Unit II

Unit III
Programming in Logic (PROLOG)

Unit IV
Understanding Natural Languages: Parsing Techniques, Context-Free and Transformational Grammars, Recursive and Augmented Transition Nets.

BOOKS RECOMMENDED:
ELECTIVE B1: THEORY OF COMPUTATION

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.

Unit IV


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

Test Book:


Reference Books

UNIT - I


UNIT - II


Unit III


UNIT - IV

Model of image degradation/restoration process, noise models, Restoration in the Presence of Noise, Only-Spatial Filtering Periodic Noise Reduction by Frequency Domain Filtering, Linear Position-Invariant Degradations, inverse filtering, minimum mean square error (Weiner) Filtering, Color Fundamentals. Color Models, Pseudo color Image Processing., processing basics of full color image processing

TEXT BOOK:


REFERENCE BOOKS:

ELECTIVE A2: DATA MINING

Unit I

Data Mining and Knowledge Discovery Process: data mining, Data Mining Differ from Other Approaches - The Knowledge Discovery Process-Introduction, Knowledge Discovery Process, Knowledge Discovery Process Models.

Data Understanding: data, Concepts of Learning, Classification, and Regression

Unit II

Data Mining: Methods for Constructing Data Models: Unsupervised Learning: Clustering-From Data to information Granules or Clusters, Categories of Clustering Algorithms, Hierarchical Clustering, Objective Function-Based Clustering, Cluster Validity, random Sampling and Clustering as a Mechanism of Dealing with large datasets.

Unit III


Supervised Learning: Bayesian Methods, Regression- Decision Trees, Rule and Hybrids Algorithms.

Unit IV


Data Security, Privacy and Data Mining: Privacy in Data Mining, Privacy Versus Levels of Information Granularity, Distributed Data Mining, Collaborative Clustering.

Text Books:

References:
2. Principles of data mining , David hand Heikki Mannila , PHI publications-2004
ELECTIVE B2: ANDROID PROGRAMMING

Unit I

Unit II
Development Tools: Installing and using Eclipse with ADT plug-in, Installing Virtual machine for Android sandwich/Jelly bean (Emulator), configuring the installed tools, creating a android project – Hello Word, run on emulator, Deploy it on USB-connected Android device.

Unit III
User Interface Architecture: Application context, intents, Activity life cycle, multiple screen sizes.
User Interface Design: Form widgets, Text Fields, Layouts, Button control, toggle buttons, Spinners (Combo boxes), Images, Menu, and Dialog.

UNIT IV
Database: Understanding of SQLite database, connecting with the database.

Book Recommended:

ONLINE READING / SUPPORTING MATERIAL:
ELECTIVE C2: UNIX PROGRAMMING

UNIT I

UNIT II
Handling Ordinary Files: cat, cp, rm, mv, more, file, wc, od, cmp, comm., diff, gzip, gunzip, tar, zip, unzip.
Basic File Attributes: ls-, The –d option, File Ownership, File Permissions, chmod,
Directory Permissions.
The Vi Editor: vi Basics, Input Mode, Saving Text and Quitting, Navigation,
Editing Text, Undoing Last Editing Instructions, Repeating the Last Command,
Searching for a pattern, Substitution.
The Shell: The shells Interpretive Cycle, Shell offerings, Pattern Matching- The Wild Cards, Escaping and Quoting, Redirecton: The Three standard Files, /dev/null and /dev/tty: Two Special Files, Pipes, tee, Command Substitution, Shell Variables.

UNIT III
Simple Filters, Regular Expressions and Grep Family: The sample Database, pr, head, tail, cut, paste, sort, uniq, tr. grep, egrep, sed.

UNIT IV
File Management: File Structures, System Calls for File Management – create, open, close, read, write.

TEXT BOOK:
1. Unix System Concepts And Applications By Sumithaba Das (Tata Mcgraw Hill)
2. Unix Net Work Programming By W.Richard Stevens(Phi/Addision Wesley Two Columns)

REFERENCE BOOK
1. Unix The Complete Reference By Rosen ,Host Farber And Rosinski-Tatamcgraw Hill
2. The Unix Programming Environment By Brian W. Kernigham& Rob Pike -Phi
PROJECT GUIDE LINES

1. Maximum 2 students shall be allowed to take up a project.
2. Guiding one project shall be considered as 4 hours of practical per week as the work load for the concerned internal guide.
3. Each student shall submit his/her project synopsis to the concerned guide within 15 days in consultation with internal guide from the commencement of the respective semester.
4. Each student has to carry out 2 project seminars compulsorily in project duration.
5. Each seminar will be considered for their internal assessment (IA).

**Scheme of valuation - 400 Marks**
- **IA – 100 Marks**
  - Synopsis - 20 Marks
  - Seminar 1 - 40 Marks
  - Seminar 2 - 40 Marks
- **Dissertation – 300 Marks**
  - Documentation - 150 Marks
  - Presentation / Demonstration - 100 Marks
  - Viva- 50 Marks
SCHEME OF QUESTION PAPER

BCA (Faculty of Sciences)
I/II/III/IV/V/VI Semesters
I-Internal Assessment Examination*
Code: Name of the Paper
(Under CBCS Scheme)

Time: 90 Min]                                                                                     [Marks: 30
Answer ALL questions.

1. From Unit-I
2. From Unit-I
3. From Unit-I
4. From Unit-I
5. From Unit-I
6. From Unit-II
7. From Unit-II
8. From Unit-II
9. From Unit-II
10. From Unit-II

SCHEME OF QUESTION PAPER

BCA (Faculty of Sciences)
I/II/III/IV/V/VI Semesters
II-Internal Assessment Examination*
Code: Name of the Paper
(Under CBCS Scheme)

Time: 90 Min]                                                                                     [Marks: 30
Answer ALL questions.

1. From Unit-III
2. From Unit-III
3. From Unit-III
4. From Unit-III
5. From Unit-III
6. From Unit-IV
7. From Unit-IV
8. From Unit-IV
9. From Unit-IV
10. From Unit-IV

*The internal marks will be calculated on the average of two internal tests
FACULTY OF SCIENCES
Bachelor of Computer Application (BCA)
CBCS Pattern in Semester System (with effect from 2016-17)

SCHEME OF QUESTION PAPER

BCA (Faculty of Sciences)
I/II/III/IV/V/VI Semesters
KAKATIYA UNIVERSITY, WARANGAL
Code: Name of the Paper
(Under CBCS Scheme)

Time: 3 hrs] [Total Marks: 70

Section - A
1. Answer any six from the following (6 X 5 = 30)
   a. from unit I
   b. from unit I
   c. from unit II
   d. from unit II
   e. from unit III
   f. from unit III
   g. from unit IV
   h. from unit IV

Section – B
Answer all questions (4 X 10 = 40)
2. (a) (OR) (b) from UNIT –I
3. (a) (OR) (b) from UNIT –II
4. (a) (OR) (b) from UNIT -III
5. (a) (OR) (b) from UNIT -IV