B.C.A.: I Year: INTRODUCTION TO INFORMATION TECHNOLOGY

UNIT-I

Data and Information: Introduction, Types of Data, A Simple Model of a Computer, Data Processing Using a Computer, Desktop Computer, The Organization of the Book

Data Storage: Introduction, Memory Cell, Physical Devices used as Memory Cells, Random access Memory, Read only Memory, Secondary Memory, Floppy Disk Drive, Compact Disk Read only Memory (CDROM), Archival Memory

Central Processing Unit: Introduction, The Structure of a Central Processing Unit, Specification of a CPU, Interconnection of CPU with Memory and I/O Units, Embedded Processors

UNIT-II

Computer Networks: Introduction, Local Area Network (LAN), Applications of LAN, Wide Area Network (WAN), Internet, Naming Computers Connected to Internet, The Future of Internet Technology

Output Devices: Introduction, Video Display Devices, Flat Panel Displays, Printers, Audio Output

Computer Software: Introduction, Operating System, Programming Languages, A Classification of Programming Languages

UNIT- III

Data Organisation: Introduction, Organizing a Database, Structure of a Database, Database Management System, Example of Database Design, Non-text Databases, Archiving Databases

Processing Numerical Data: Introduction, Use of Spreadsheets, Numerical Computation Examples

UNIT-IV

Some Internet Applications: Introduction, E-mail, Information Browsing Service, The World Wide Web, Information Retrieval from the World Wide Web, Other Facilities Provided by Browsers, Audio on the Internet, Pictures, Animation and Video via Internet

Societal Impacts of Information Technology: Introduction, Privacy, Security and Integrity of Information, Disaster Recovery, Intellectual Property Rights, Careers in Information Technology

Prescribed Books:

Introduction of Information Technology, by V. Rajaraman, PHI Learning Private Limited. (Chapters : 1, 6 to 12, 15, 18)

Model Question Paper

B.C.A. : I Year: Information Technology

Time: 3 Hrs. **Max. Marks: 100**

SECTION – A

Answer ALL Questions : 10 x 2 = 20 M

1.a) Define a Computer.
b) What is the difference between Data and Information?
c) Give some examples of Application Software.
d) What is the use of storing data in registers?
e) What is a Network?
f) Explain about softcopy output devices.
g) Define Operating System.
h) Explain the use of Protocols in Internet.
i) What is a database?
h) Write any two methods to recover data from attacks.

SECTION – B

Answer ALL of the following questions: 4*20=80M

2.a) Explain the simple model of a Computer.
b) What are different types of data that can be given as input to the Computer?

(OR)

c) Explain different types of storage used for backups.

3.a) Explain the types of networks.
b) What are the functions of an Operating System?

(OR)

c) What is a Computer Language? Explain different types of Computer Languages.
d) Discuss the steps involved in developing a program.

4.a) What are the differences between File Management System and Database Management System?
b) Explain briefly about Database Management System.

(OR)

c) Explain the uses of Spreadsheets.
d) What are the different types of charts and Explain briefly about each of them?

5.a) Write a short notes on E-mail System.
b) Explain the use of FTP Protocol in File Transferring.

(OR)

c) Explain the impact of Information Technology On Society.
d) How can you provide security to a PC from attacks?

B.C.A.: I Year: PROGRAMMING USING C

UNIT-I

Problem Solving Using Computers: Introduction, Algorithms, Flow Charts, Pseudocode

Overview of C Language & C Language Preliminaries: Introduction, Salient Features of C Language, General Structure of a C Program, Sample C Program-1, Sample C Program-2, Execution of a C Program, Errors, Introduction, Keywords and Identifiers, Constants, Variables, Data Types

Input-Output Operations: Introduction, The getchar() and Putchar() functions, The scanf() and printf() functions, Formatting of Outputs

UNIT-II

Operators and Expressions: Introduction, Assignment Operator[=], Arithmetic Operators [unary +, unary -,+,-,*,/,%], Relational Operators [<, <=, >, >=, ==, !=], Logical Operators [&&,||,!], Shorthand Arithmetic Assignment Operators [+=, -=,*=,/=,%=], Increment/Decrement Operators [++,--], Conditional Operator [?:], The sizeof() Operator, The Comma Operator [,], Type Conversion, Precedence Levels and Associativity Among All the Operators

Decision-Making and Branching (Selection): Introduction, The simple-if Statement, The if-else Statement, The Nested if-else Statement, The else-if Ladder, The Switch Statement, The goto Statement

Looping Statements in C: Introduction, The while Loop, The for Loop, The do-while loop, Which Loop to Use When, Jumps in Loops, Nesting of Loops

UNIT-III

Functions: Introduction, Advantages of Functions, Classification of Functions, Functions with No Arguments and No Return Value, Functions with Arguments and No Return Value, Functions with Arguments and Return Value, Functions with No Arguments but with Return Value, Functions Returning a Non-integer Value, Nesting of Functions, Return Statement, Recursion, Storage Classes, Multi file Programs

Arrays: Introduction, Definition of an Array, One-dimensional Arrays, Multidimensional Arrays, Arrays and Functions

Strings: Introduction, String I/O Initialization of Arrays of char type, Arithmetic and Relational Operations on Characters, String Manipulations, Two-dimensional Array of char Type, Strings and Functions

UNIT-IV

Structures and Unions: Introduction, Definition of Structure Template, Declaration of Structure Variables, Initialization of Structure Variables, Operations on Structures, Arrays and Structures, Structure within Structure, Structures and Functions, Union, Enumerated Data Type, typedef

Pointers: Introduction, Pointer operators &, *, Pointer Arithmetic, Pointers and Arrays, Pointers and Strings, Pointers and Unions, Pointers and Functions, Pointers to Pointers, Dynamic Memory Allocation

File Handling in C: Introduction, Operators on Files, Opening and Closing of Files, File I/O Functions, Random Accessing of Files- fseek(), ftell(), rewind(), Error Handling During File I/O Operations, Command Line Arguments

Chapters : 1,(3,4),5 to 14

Prescribed Books:

Problem Solving with C, Eastern Economy Edition (PHI), by M.T.Somashekara

Model Question Paper

B.C.A. : I Year: Programming using C

Time: 3 Hrs. **Max. Marks: 100**

SECTION – A

1) Answer the following Questions : 10 x 2 = 20M

a) Define Algorithm.
b) Define Identifier.
c) What is the Purpose of sizeof() operator.
d) Compare while and do-while loops. Justify your answer.
e) Define Recursion.
f) How can we initialize an array.
g) What is the difference between structure and union ?
h) Define Pointer variable.
i) Define Macro.
j) What is the purpose of rewind() function.

Section – B

Answer the following questions. 4 x 20 = 80M

2. a) Explain the structure of a 'C' program.
   b) Explain features of 'C' language.

(or)

   c) Describe in brief the operators in 'C' language.
   d) Write a 'C' program to evaluate the following expression.
   (a+(b*c)/d)

3. a) Explain control structures with examples.

(or)

   b) Explain different parameter passing techniques.
   c) Write a program to calculate factorial of given number using Recursion.

4. a) Define array. Write a 'C' program to sort elements of array in ascending order.
   b) Explain string manipulation function with examples.

(or)

   c) How can we pass strings as arguments to functions.
   d) Explain Nested structures with examples.

5. a) Explain Pointer Arithmetic with examples.
   b) Write a 'C' program to access array elements using Pointers.

(or)

   c) Explain different file modes available in 'C' language.
   c) Describe in brief about Random Access Files.

* * * * *

I BCA: Proposed Lab Cycle: MS Office Lab

MS – WORD

1. **Create a bio-data form giving that contains the following details:**

   Name, Father's name, Date of birth, Qualification, Profession, Hobbies, Address, Phone number, E-mail address, Extra Curricular Activities, Achievements etc.

2. **Design a document to illustrate the procedure to divide text into "Columns".**

3. **Design a visiting card for a Managing Director of a company as per the following specifications:**

   i. **Size of the visiting card: 3.5" X 2".**
   ii. **Name of the company with a big font using THOMA.**
   iii. **Phone Number, Fax Number and mail address with appropriate symbols.**
   iv. **Office and Residence address separated by a line.**

4. **Design a Letter pad for a Managing Director of a company as per the following specifications:**

   i. **Company logo.**
   ii. **Company Address and other related features.**
   iii. **Business Profile.**
   iv. **If there is any other specifications**

5. **Design a Document to illustrate the hyperlinking.**

MS – EXCEL

1. **Create an Excel Spreadsheet to store the student details and calculate the result depending upon the following conditions.**

   i. **Read any 5 Subject Marks.**
   ii. **For Qualifying, minimum marks are 40%**
   iii. **For Pass average is 50%**
   iv. **For First Class Percentage is >=60**
   v. **For Second Class Percentage is between 40 and 59**
   vi. **For Third Class Percentage is 40**
   vii. **Minimum percentage is <50 then Result is Fail.**

2. **Create an electronic Spreadsheet, to demonstrate the Engineering Functions.**

3. **Develop the charts by using Exercise 1 spreadsheet data**

   i. **Bar Chart indicating the student total marks, the chart should represent the class highest, least and average totals.**
   ii. **Pi chart for every student marks with respect to Subject M2.**

4. The ABC Company shows the sales of different products for 5 years.
   Create column chart, 3D-column and Bar chart for the following data

YEAR	PRODUCT-1	PRODUCT-2	PRODUCT-3	PRODUCT-4
2005	1000	800	900	1000
2006	800	80	500	900
2007	1200	190	400	800
2008	400	200	300	1000
2009	1800	400	400	1200

MS – ACCESS

1. Create a database by using following tables and populate the table with at least 10 rows.

   i. DEPT(DEPTNO,DNAME,LOCATION)
   ii. EMP(EMPNO,ENAME,SAL,DEPTNO)

   Conditions:

   i. DEPTNO is primary key for the table DEPT.
   ii. EMPNO is primary key for the table EMP.
   iii. Employees DEPTNO act as reference key.

2. By using EMP, DEPT tables solve the following queries.

   i. Find the EMPNO,ENAME,DNAME.
   ii. Count the total employees for each a department.
   iii. Find out the total salary of every department.
   iv. Display EMPNO,ENAME,SAL, DNO, DNAME.
   v. Display Maximum salaried employee details for every department.

3. Create the database by using following tables

   STUDENT (REGISTER NUMBER,NAME,DOB,GENDER,CLASS)

   STD_MARKS(REGISTER NUMBER,M1, M2, M3, M4, M5, TOTAL)

(Note: Insert the data into the tables by using forms, by using procedure Calculate the TOTAL attribute value)

Maintain the relationship between above two tables with REGISTER NUMBER as a Primary Key and answer the following reports:

Reports must have following columns

Report1 with REGISTER NUMBER, NAME, MARKS OF ALL SUBJECTS and TOTAL

Report2 with REGISTER NUMBER, TOTAL, PERCENTAGE.

4. Create a database using MS-ACCESS with at least 5 records
   TABLE1 STRUCTURE:
       EMP-CODE EMP-NAME AGE GENDER DOB

   TABLE2 STRUCTURE:
       EMP-CODE   BASIC-PAY

   Maintain the relationship between two tables with EMP-CODE as a Primary Key generate the following reports:

   REPORT1:
   EMP-CODE EMP-NAME BASIC-PAY DA HRA GROSS-SALARY

   REPORT2:
   EMP-CODE EMP-NAME AGE GENDER GROSS-SALARY

MS Power Point

1. Make a Power point presentation on your strengths, weaknesses, hobbies, factors that waste your time.
2. Make a Power point presentation on any Current affair (Not less than 8 slides)
3. Make a Power point presentation to represent your College profile.
4. Make a Power point presentation of all the details of the books that you had studied in B.C.A. First Year.

I BCA: Proposed Lab Cycle: C Programming

1. Write a C program to calculate the following expression:
   ((a*b)/c)+(a+b-c)
2. Write a C program to calculate $(a+b+c)^3$.
3. Program to convert temperature from
   a. Celsius to Fahrenheit.
   b. Fahrenheit to Celsius.
4. Write a C program to calculate the Compound Interest.
5. Program to convert Hours into seconds.
6. Write a C program to Fine Biggest of Three numbers.
7. Write a C program to read student marks in five subjects and calculate the Total, Average and Grade according to the following conditions:

   i. If average >=75 grade is 'A'.
   ii. If average >=60 and <75 grade is 'B'.
   iii. If average >=50 and <60 grade is 'C'.
   iv. Otherwise grade is 'D'.
   v. Check that marks in each subject >= 35.
8. Write a C program to find biggest of two numbers using Switch – Case.
9. Program to display number of days in given month using Switch – Case.
10. Write a C program to check whether the given number is Prime or Not.

11. Write a program to
    i. Check whether given number is Palindrome or Not.
    ii. Find the Reverse of a given number.
12. Program to check whether a given number is
    i. Strong or Not.
    ii. Armstrong or Not.
    iii. Perfect or Not.
13. Write a C program to print Fibonacci Series.
14. Write a C Program to print Prime Numbers up to given range.
15. Program to demonstrate
    i. Break Statement.
    ii. Continue Statement.
    iii. Goto labeled Statement.
16. Write a program to print multiplication tables up to given range.
17. Write a program to Find Second Maximum and Second Minimum of an array.
18. Program to implement Binary Search.
19. Program to Sort elements of an array in Ascending Order.
20. Write a C program to perform
    i. Matrix Multiplication.
    ii. Transpose.
21. Write a program to sort given number of Strings.
22. Write a C program to Check whether given string is Palindrome or Not.
23. Program to display Student Details using Structures.
24. Write a program to demonstrate Concept of Nested Structures. and Unions.

25. **Program to swap two numbers using different parameter passing techniques.**
26. **Write a program to demonstrate passing arrays and structures to functions.**
27. **Write a program to**
    - **i. Find factorial of given number.**
    - **ii. Print Fibonacci Series using recursion.**
28. **Program to demonstrate Pointer Arithmetic.**
29. **Write a C program to access**

    i. Array elements using pointers.
    ii. Structures elements using pointers.

30. **Write a C program to**

    - **i. Write data into a File.**
    - **ii. Read data from a File.**
    - **iii. Searching a record from File.**
    - **iv. Update a record in a File.**

B.C.A: II Year:

Object Oriented Programming using C++ and Data Structures

UNIT – I

Principles of Object-Oriented Programming : Software Crisis, Software Evolution, A Look at Procedure-Oriented Programming, Object-Oriented Programming Paradigm, Basic Concepts of Object-Oriented Programming, Benefits of OOP, Object-Oriented Languages, Applications of OOP

Beginning with C++ : What is C++?, Applications of C++, A Simple C++ Program, More C++ Statements, An Example with Class, Structure of C++ Program, Creating the Source File, Compiling and Linking

Token, Expressions and Control Structures : Introduction, Tokens, Keywords, Identifiers and Constants, Basic Data Types, User-Defined Data Types, Derived Data Types, Symbolic Constants, Type Compatibility, Declaration of Variables, Dynamic Initialization of Variables, Reference Variables, Operators in C++, Scope Resolution Operator, Member Dereferencing Operators, Memory Management Operators, Manipulators, Type Cast Operator, Expressions and their types, Special Assignment Expressions, Implicit Conversions, Operator Overloading, Operator Precedence, Control Structures

UNIT – II

Functions in C++ : Introduction, The Main Function, Function Prototyping, Call by Reference, Return by Reference, Inline Functions, Default Arguments, Const Arguments, Function Overloading, Friend and Virtual Functions, Math Library Functions.

Classes and Objects : Introduction, C Structures Revisited, Specifying a Class, Defining Member Functions, A C++ Program With Class, Making an Outside Function Inline, Nesting of Member Functions, Private Member Functions, Array within a Class, Memory Allocation for Objects, Static Data Members, Static Member Functions, Array of Objects, Objects as Function Arguments, Friendly Functions, Returning Objects, Const Member Functions, Pointers to Members, Local Classes

Constructors and Destructors : Introduction, Constructors, Parameterized Constructors, Multiple Constructors in a Class, Constructors with Default Arguments, Dynamic Initialization of Objects, Copy Constructor, Dynamic Constructors, Constructing Two-dimensional Arrays, Const Objects, Destructors

UNIT – III

Operator Overloading and Type Conversions : Introduction, Defining Operator Overloading, Overloading Unary Operators, Overloading Binary Operators, Overloading Binary Operators Using Friends, Manipulation of Strings Using Operators, Rules for Overloading Operators, Type Conversions

Inheritance : Extending Classes : Introduction, Defining Derived Classes, Single Inheritance, Making a Private Member Inheritable, Multilevel Inheritance, Multiple Inheritance, Hierarchical Inheritance, Hybrid Inheritance, Virtual Base Classes, Abstract Classes, Constructors in Derived Classes, Member Classes : Nesting of Classes

Pointers, Virtual Functions and Polymorphism: Introduction, Pointers, Pointers to Objects, this Pointer, Pointers to Derived Classes, Virtual Functions, Pure Virtual Functions

Templates : Introduction, Class Templates, Class Templates with Multiple Parameters, Function Templates, Function Templates with Multiple Parameters, Overloading of Template Functions, Member Function Templates, Non-type Template Arguments

UNIT – IV

Linked Lists : Introduction, Linked Lists, Representation of Linked Lists in Memory, Traversing a Linked List, Searching a Linked List, Memory Allocation ; Garbage Collection, Insertion into a Linked List, Deletion from a Linked List, Header Linked Lists, Two-way Lists

Stacks, Queues, Recursion : Introduction, Stacks, array Representation of Stacks, Linked Representation of Stacks, Arithmetic Expressions : Polish Notation, Quick sort, an Application of Stacks, Recursion, Towers of Hanoi, Implementation of Recursive Procedures by Stacks, Queues, Linked Representation of Queues, Deques, Priority Queues

Trees : Introduction, Binary Trees, Representing Binary Trees in Memory, Traversing Binary Trees, Traversal Algorithms using Stacks, Header Nodes; Threads, Binary Search Trees, Searching and Inserting in Binary Search Trees, Deleting in a Binary Search Tree, AVL Search Trees, Insertion in an AVL Search Tree, Deletion in an AVL Search Tree, m-way Search Trees, Searching, Insertion and Deletion in an m-way Search Tree, B Trees, Searching, Insertion and Deletion in a B-tree, Heap; Heapsort, Path Lengths; Huffman's Algorithm, General Trees.

Prescribed Book :

Book 1 : Object Oriented Programming with C++, by E Balagurusamy, Fourth Edition, The McGraw - Hill Education

Book 2 :Data Structures, by Seymour Lipschutz, Adapted by : G A V Pai,(Schaum's Outlines)

Chapters :

Book 1 : 1 to 9, 12

Book 2 : 5 to 7

Model Question Paper

B.C.A. : II Year: Theory Paper-1

OBJECT ORIENTED PROGRAMMING USING C++ AND DATA STRUCTURES

Time: 3 Hrs. **Max. Marks: 100**

SECTION – A

1) Answer the following Questions **10 x 2 = 20M**

a) Define Token.
b) Explain the difference between 'C' structures and 'C++' structures.
c) What is an abstract data type?
d) Give an real time example of multi-level inheritance.
e) What is the use of "this" pointer.
f) What is a pure virtual Function ?
g) Define a template. What is the use of defining generic Functions.
h) What is Recursion? Give an example.
i) What are the basic operations that can be performed on Linked List ?
j) Define a complete Binary Tree.

Section – B

Answer the following Questions **4 x 20 = 80M**

2. a) Compare and contrast the procedure oriented and Object Oriented approach.
   b) Explain the basic concepts of OOPS.

(or)

   c) Explain different Operators in C++.
   d) Explain Function parameter passing techniques with examples.

3. a) What is a Class? How can we define it? Explain with an example.
   b) Define Constructor. Explain Constructor Overloading with an example.

(or)

   c) Write a C++ program to perform string concatenation and string copy operations by using Operator Overloading.
   d) Define Inheritance. Explain different types of inheritance with examples.

4. a) Explain virtual Function with example.
   b) Define Template. Explain Function and Class templates in C++.

(or)

   c) What is double linked list ? What are its advantages over Single Linked List ? Explain procedure to Insert an element into double linked list.
   d) Sort the following elements into double linked list.
   23, 5, 11, 46, 64, 36, 15,53, 20, 42

5. a) Implement Operations of Circular Queue.
   b) Write an algorithm to evaluate postfix expression.

(or)

   c) Write a program to implement operations on B.S.T.
   d) Explain tree traversal algorithms.

B.C.A: II Year: DATABASE MANAGEMENT SYSTEMS

UNIT-I

An Overview of DBMS and DB Systems Architecture : Introduction to Database Management Systems, Data Models Database System Architecture

An Introduction to SQL and Relational Database Concepts : The SQL Language, Relational Database Management Systems, Candidate Key and Primary Key of Relation, Foreign Keys, Relational Operators, Attribute Domains and Their Implementations, Name Conventions for Database Objects, Structure of SQL Statements and SQL Writing Guidelines, Interacting with the Oracle RDBMS through SQL* Plus, Creating Tables, Describing the Structure of a Table, Populating Tables

The Entity- Relationship Model : The Entity-Relationship Model, Entities and Attributes, Relationships, One-to-One Relationships, Many-to-One and Many-to-Many Relationships, Normalizing the Model, Table Instance Charts

UNIT-II

Functional Dependencies : Introduction, Definition of Functional Dependencies, Functional Dependencies and Keys, Inference Axioms for Functional Dependencies, Redundant Functional Dependencies, Closures, Cover and Equivalence of Functional Dependencies

The Normalization Process : Introduction, First Normal Form, Data Anomalies in 1NF Relations, Partial Dependencies, Second Normal Form, Data Anomalies in 2NF Relations, Transitive Dependencies, Third Normal Form, Data Anomalies in 3NF Relations, Boyce-Codd Normal Form, Lossless or Lossy Decompositions, Preserving Functional Dependencies

Basic Security Issues : The Need for Security, Physical and Logical Security, Design Issues, Maintenance Issues, Operating System Issues and Availability, Accountability, Integrity

UNIT- III

Implementation of the Relational Operators in SQL : Implementation of the Selection Operator, Using Aliases to Control Column Headings, Implementation of the Projection Operator, Implementation of the Join Operator, Creating Foreign Keys, Defining Primary Keys in an Existing Table, Using CHECK Constraints to Restrict a Column's Input Values, Adding Columns to an Existing Table, Modifying Columns of an Existing Table, Removing Constraints from a Table

Boolean Operators and Pattern Matching : Boolean Operators and Pattern Matching Compound Clauses, Pattern Matching – the like Statement and Wildcard Characters, Matching Values in a List or a Range of Values

Arithmetic Operations and Built-in Functions : Arithmetic Operations, Built-in Functions, Built-in Functions-Individual Numeric, Built-in Functions – Character, Important Conversion Functions

UNIT-IV

Group Functions : Introduction to Group Functions, The SUM(n) and AVG(n) Functions, The max(n) and min(n) Functions, The Count () Functions, Combining Single-Value and Group Functions, Displaying Specific Groups

Processing Date and Time Information : Introduction to Processing Date and Time, Arithmetic with Dates, Date Functions, Formatting Dates and Times

Complex Queries and Set Operators : Subqueries, Correlated Queries, Using Subqueries to Create Tables, Updating a Table Using Subqueries, Inserting Values into a Table Using Subqueries, Deleting Rows from a Table Using Subqueries

Prescribed Book :

Database Management Systems, by Ramon A Mata-Toledo, Pauline K Cushman, Adapted by Debabrata Sahoo, The McGraw - Hill Companies (Schaum's Outlines) Chapters : 1 to 11, 15

Model Question Paper

B.C.A. : II Year: Database Management Systems

Time: 3 Hrs. **Max. Marks: 100**

SECTION – A

1. Answer ALL Questions : 10 x 2 = 20 M

a. Define Database environment components?
b. What is the difference between DDL and DML?
c. Give an example for Bridge Entity.
d. What is dependency preservation?
e. Give the complete syntax for SELECT statement
f. Explain the purpose of the CHECK constraint.
g. Write a query to display the given number is even or odd.
h. Describe the Oracle Data types.
i. What is correlated query?
j. What is metadata?

SECTION – B

Answer ALL Questions : 4 x 20 = 80 M

2.a) What is meant by Database? Describe about the advantages of DBMS.
b) Explain about Three Level Architecture of Database.

(or)

c) What is meant by Key? Discuss about different categories of Keys.
d) Explain about the components of ER model.

3.a) Given the relation R(A,B,C) and the set F={AB->C,B->C,D->B} of functional dependencies. Find the candidate keys of the relation. How many candidate keys are in this relation? What are the prime attributes.
b) Explain about design issues to be considered, while developing the database.

(or)

c) What is normalization? Discuss about INF and VNF.
d) Justify with an example, a relation which is in BCNF must be in the 3NF, but the vice-versa may not be true.

4. a) Create the following tables with following conditions.

Table 1: EMP(EMPNO,ENAME,SAL,MGR,JOB,DOJ,DOB,DEPTNO)
Table 2: DEPT(DNO,DNAME,LOCATION)

Conditions:

i. Employee's department number should be in Department table.
ii. An employee should belongs to one of the department 10, 20,30.

b) Solve the following queries

i. Find all employees who are getting highest salary in their departments.

ii. Find out the employee details, who were born in the month of January and working as clerks.

(or)

c) Explain about relational algebra operations with the help of example.

5.a) Describe about Group Functions with the help of example.

(or)

b) Explain about any Four Date Functions with example.

c) Discuss about To_Date() and To_Char() and also explain how these two are different.

*** * * * ***

II BCA: Proposed Lab Cycle: DS

C++ Programs

1. **Write a C++ Program to implement inline functions.**
2. **Write a C++ Program to illustrate reference variable.**
3. **Write a C++ Program to implement default arguments.**
4. **Write a C++ Program to implement static data members and static member function.**
5. **Write a C++ Program to check the given number is Strong or not.**
6. **Write a C++ Program to check the given number is palindrome or not.**
7. **Write a C++ Program to check the given number is Armstrong or not.**
8. **Write a C++ Program to implement parameterized and copy constructors.**
9. **Write a C++ Program to implement constructor overloading.**
10. **Write a C++ Program to overload +=,-=,*=,/= on complex numbers.**
11. **Write a C++ Program to implement single inheritance.**
12. **Write a c++ Program to implement multilevel inheritance.**
13. **Write a c++ Program to implement multiple inheritance.**
14. **Write a C++ Program to implement Hierarchical inheritance.**
15. **Write a C++ Program to sort an array using function templates.**

Data Structures

01. **Program to create, insert, delete and display operations on single linked list ?**
02. **Program to create, insert, delete and display operations on double linked list ?**
03. **Program to create, insert, delete and display operations on Circular single linked list?**
04. **Program to split a single linked list**
05. **Program to reverse a single linked list**
06. **Program to implement Insertion Sort.**
07. **Program to implement PUSH and POP operations on Stack using array method.**
08. **Program to implement PUSH and POP operations on Stack using Linked list method.**
09. **Program to implement insert and delete operations on Queue using array method.**
10. **Program to implement insert and delete operations on Queue using linked list method.**
11. **Program to implement insert and delete operations on Priority Queue?**
12. **Program to implement insert and delete operations on Double Ended Queue?**
13. **Program to evaluate postfix expression by using Stack?**
14. **Program to construct Binary Search Tree and implement tree traversing Techniques.**
15. **Program to delete a leaf node from binary search tree.**

SHIPMENT DATABASE

AN ENTERPRISE WISHES TO MAINTAIN THE DETAILS ABOUT HIS SUPPLIERS AND OTHER CORRESPONDING DETAILS. FOR THAT IT USES THE FOLLOWING TABLES

TABLE S(SID,SNAME,ADDRESS)

PRIMARY KEY : SID

TABLE P(PID,PNAME,COLOR)

PRIMARY KEY : PID

TABLE CAT(SID,PID,COST)

PRIMARY KEY : SID+PID

REFERENCE KEY : SID REFERENCES S.SID
PID REFERENCES P.PID

Solve the following queries

1. **FIND THE PNAMES OF PARTS FOR WHICH THERE IS SOME SUPPLIER**

2. **FIND THE SNAMES OF SUPPLIERS WHO SUPPLY EVERY PART.**

3. **FIND THE SNAMES OF SUPPLIERS WHO SUPPY EVERY RED PART.**

4. **FIND THE PNAMES OF PARTS SUPLLIED BY LONDON SUPPLIER AND BY NO ONE ELSE**

5. **FIND THE SIDS OF SUPPLIERS WHO CHARGE MORE FOR SOME PART OTHER THAN THE AVERAGE COST OF THAT PART**

6. **USING GROUP BY WITH HAVING CLAUSE GET THE PART NUMBERS FOR ALL THE PARTS SUPPLIED BY MORE THAN ONE SUPPLIER.**

7. **GET THE NAMES OF THE SUPPLIERS, WHO DO NOT SUPPLY PART P2.**

8. **FIND THE SIDS OF SUPPLIERS WHO SUPPLY A RED AND A GREEN PART**

9. **FIND THE SIDS OF SUPPLIERS WHO SUPPLY A RED OR A GREEN PART**

10. **FIND THE TOTAL AMOUNT HAS TO PAY FOR THAT SUPPLIER BY PART LOCATED FROM LONDON**

Order Tracking Database

The Order Tracking Database consists of the following defined six relation schemas.

EMPLOYEES(ENO,ENAME,ZIP,HDATE)
PARTS(PNO,PNAME,QOH,PRICE,LEVEL) (HINT: QOH: QUALITY ON HAND)
CUSTOMERS(CNO,CNAME,STREET,ZIP,PHONE)
ORDERS(ONO,CNO,ENO,RECEIVED DATE,SHIPPED DATE)
ODETAILS(ONO,PNO,QTY)
ZIPCODES(ZIP,CITY)

Solve the following queries

1. **GET ALL PAIRS OF CUSTOMER NUMBERS FOR CUSTOMERS BASED ON SAME ZIP CODE.**
2. **GET PART NUMBERS FOR PARTS THAT HAVE BEEN ORDERED BY AT LEAST TWO DIFFERENT CUSTOMERS.**
3. **FOR EACH ODETAIL ROW, GET ONO,PNO,PNAME,QTY AND PRICE VALUES ALONG WITH THE TOTAL PRICE FOR THE ITEM. (TOTAL PRICE=PRICE*QTY)**
4. **GET CUSTOMER NAME AND EMPLOYEE PAIRS SUCH THAT THE CUSTOMER WITH NAME HAS PLACED AN ORDER THROUGH THE EMPLOYEE.**
5. **GET CUSTOMER NAMES LIVING IN FORT DODGE OR LIBERAL.**
6. **GET CNAME VALUES OF CUSTOMERS WHO HAVE ORDERED A PRODUCT WITH PNO 10506.**
7. **GET PNAME VALUES OF PARTS WITH THE LOWEST PRICE.**
8. **GET CNAME VALUES OF CUSTOMERS WHO HAVE PLACED AT LEAST ONE ORDER THROUGH THE EMPLOYEE WITH NUMBER 1000.**
9. **GET THE CITIES IN WHICH CUSTOMERS OR EMPLOYEES ARE LOCATED.**
10. **GET THE TOTAL SALES IN DOLLARS ON ALL ORDERS.**
11. **GET PART NAME VALUES THAT COST MORE THAN THE AVERAGE COST OF ALL PARTS.**
12. **GET PART NAMES OF PARTS ORDERED BY AT LEAST TWO DIFFERENT CUSTOMERS.**
13. **GET FOR EACH PART GET PNO,PNAME AND TOTAL SALES**
14. **FOR EACH PART, GET PNO,PNAME, TOTAL SALES, WHOSE TOTAL SALES EXCEEDS 1000**
15. **GET PNO, PART NAMES OF PARTS ORDERED BY AT LEAST TWO DIFFERENT CUSTOMERS.**
16. **GET CNAME VALUES OF CUSTOMERS WHO HAVE ORDERED PARTS FROM ANY ONE EMPLOYEE BASED IN WICHITA OR LIBERAL.**

Employee Database

An enterprise wishes to maintain a database to automate its operations. Enterprise divided into to certain departments and each department consists of employees. The following two tables describes the automation schemas

DEPT (DEPTNO, DNAME, LOC)
EMP (EMPNO,ENAME,JOB,MGR,HIREDATE,SAL,COMM,DEPTNO)

1. **CREATE A VIEW, WHICH CONTAIN EMPLOYEE NAMES AND THEIR MANAGER NAMES WORKING IN SALES DEPARTMENT.**
2. **DETERMINE THE NAMES OF EMPLOYEE, WHO EARN MORE THAN THEIR MANAGERS.**
3. **DETERMINE THE NAMES OF EMPLOYEES, WHO TAKE HIGHEST SALARY IN THEIR DEPARTMENTS.**
4. **DETERMINE THE EMPLOYEES, WHO LOCATED AT THE SAME PLACE.**
5. **DETERMINE THE EMPLOYEES, WHOSE TOTAL SALARY IS LIKE THE MINIMUM SALARY OF ANY DEPARTMENT.**
6. **UPDATE THE EMPLOYEE SALARY BY 25%, WHOSE EXPERIENCE IS GREATER THAN 10 YEARS.**
7. **DELETE THE EMPLOYEES, WHO COMPLETED 32 YEARS OF SERVICE.**
8. **DETERMINE THE MINIMUM SALARY OF AN EMPLOYEE AND HIS DETAILS, WHO JOIN ON THE SAME DATE.**
9. **DETERMINE THE COUNT OF EMPLOYEES, WHO ARE TAKING COMMISSION AND NOT TAKING COMMISSION.**
10. **DETERMINE THE DEPARTMENT DOES NOT CONTAIN ANY EMPLOYEES.**
11. **FIND OUT THE DETAILS OF TOP 5 EARNER OF COMPANY.**
12. **DISPLAY THOSE MANAGERS NAME WHOSE SALARY IS MORE THAN AVERAGE SALARY OF HIS EMPLOYEES.**
13. **DISPLAY THOSE EMPLOYEES WHO JOINED THE COMPANY BEFORE 15TH OF THE MONTH?**

14. DISPLAY THE MANAGER WHO IS HAVING MAXIMUM NUMBER OF EMPLOYEES WORKING UNDER HIM?

15. PRINT A LIST OF EMPLOYEES DISPLAYING 'LESS SALARY' IF LESS THAN 1500 IF EXACTLY 1500 DISPLAY AS 'EXACT SALARY' AND IF GREATER THAN 1500 DISPLAY 'MORE SALARY'?
16. DISPLAY THOSE EMPLOYEES WHOSE FIRST 2 CHARACTERS FROM HIRE DATE-LAST 2 CHARACTERS OF SALARY?
17. DISPLAY THOSE EMPLOYEES WHOSE 10% OF SALARY IS EQUAL TO THE YEAR OF JOINING?
18. IN WHICH YEAR DID MOST PEOPLE JOIN THE COMPANY? DISPLAY THE YEAR AND NUMBER OF EMPLOYEES.
19. DISPLAY THE HALF OF THE ENAMES IN UPPER CASE AND REMAINING LOWER CASE
20. DISPLAY ENAME, DNAME EVEN IF THERE NO EMPLOYEES WORKING IN A PARTICULAR DEPARTMENT(USE OUTER JOIN).

University Database

University wishes to computerise their operations by using the following relations.

Student (snum:Integer, sname: string, major: string, level: string, age: integer)
Class (name: String, Hour:Integer, room: string, fid: integer)
Enrolled (sum: integer, cname: string)
Faculty (fid: Integer, fname: String, deptid: Integer)
Depart (deptid: Integer, dname: String, loc: integer)

By using above schema definitions, resolve the following queries

1. FIND THE NAMES OF ALL JUNIORS (LEVEL=JR) WHO ARE ENROLLED IN A CLASS TAUGHT BY SMITH.
2. FIND THE AGE OF THE OLDEST STUDENT WHO IS EITHER A HISTORY MAJOR OR IS ENROLLED IN THE COURSE OF SMITH.
3. FIND THE NAMES OF ALL CLASSES THAT EITHER MEET R128 OR HAVE FIVE OR MORE STUDENTS ENROLLED.
4. FIND THE NAMES OF ALL STUDENTS WHO ARE ENROLLED IN TWO CLASSES THAT MEET AT THE SAME HOUR.
5. FIND THE NAMES OF FACULTY MEMBERS WHO TEACH IN EVERY ROOM IN, WHICH SOME CLASS IS TAUGHT.
6. FIND THE NAMES OF FACULTY MEMBERS FOR WHOM THE COMBINED ENROLLMENT OF THE COURSES THAT THEY TEACH IS LESS THAN FIVE.
7. PRINT THE LEVEL AND AVERAGE AGE OF STUDENTS FOR THAT LEVEL, FOR EACH LEVEL.
8. PRINT THE LEVEL AND AVERAGE AGE OF THE STUDENT FOR THAT LEVEL, FOR ALL LEVELS EXCEPT JR.
9. FIND THE NAMES OF STUDENTS WHO ARE ENROLLED IN THE MAXIMUM NUMBER OF CLASSES.
10. FIND THE NAMES OF THE STUDENTS WHO ARE NOT ENROLLED IN ANY CLASS.

B.C.A: III Year: PROGRAMMING WITH JAVA

UNIT- I

OOP and Java : Introduction, Objects and Classes, Java Language, Creating and Executing a Java Application, Understanding the Code of the Hello. Java Program.

The Primaries : Introduction, Character Set, Tokens, Constants, Variables, Operators and Expressions, Library Methods, Strings, I/O (Input/Output) Statements, Simple Programs, Formatting the Output Values.

Control Statements :Introduction, 'if' Statement, 'switch' Statement, 'while' Statement, 'do..while' Statement, 'for' Statement.

UNIT-II

Arrays and Methods: Introduction, One-Dimensional Arrays, Two-Dimensional Arrays, Methods, Method Overloading, Recursion.

Classes and Objects : Introduction, General Form of a Class, Creation of Objects, Usage of Constructors, 'this' Keyword, Constructor Overloading, Copy Constructors, Static Data Members, Static Methods, 'finalize()' Method, Inner Classes and Anonymous Inner Classes.

Inheritance and Polymorphism : Introduction, Inheriting the Variables in a Class, Inheriting the Methods in a Class, Inheritance and Constructors, Abstract Classes Final Classes.

UNIT-III

The java.lang Package : Introduction, Type-Wrappers, The Number Class, The Byte, Short, Integer and Long Classes, The Float and Double Classes, The Character Class, The Boolean Class, The Process Class, The Runtime Class, The System Class, The Object Class, The Class Class, The Math Class, The String Class, String Buffer Class.

Interfaces and Packages : Introduction, Interfaces, Structure of an interface, Implementation of an Interface, Interface Inheritance, Packages, The Package Statement, Placing the Classes in a Package, Package Hierarchy, Import Statement, Hiding the Classes in a Package, Access Control Modifiers.

Applets: Introduction, The Life Cycle of an Applet, The Applet Class, Development and Execution of a Simple Applet, Syntax of Applet Tag.

UNIT- IV

Exception Handling : Introduction, Default Exception Handling, User defined Exception Handling Mechanism, Exception and Error Classes, Catch Block Searching Pattern, 'throw' Statement, 'throws' Clause, Custom Exceptions.

Multi Threading : Introduction, Life Cycle of a Thread, Creating and Running Threads, Methods in the Thread Class, Setting the Priority of a Thread Synchronization, Dead Lock, Inter-Thread Communication, Applets Involving Threads.

I/O Streams : Introduction, Text and Binary Formats of Data, Input Stream and Output Stream Classes, Reader and Writer Classes, Data Output Stream and Data Input Stream Classes, Stream Tokenizer Class, Random Access File Class, Filter Streams, Print Streams, Object Streams.

Java Database Connectivity : Introduction, Establishing a Connection, Creation of Data Tables, Entering Data into the Tables, Table Updating, Use of Prepared Statement, Using Transaction, Scrollable Result Sets, Stored Procedures.

Prescribed Book :

Programming with Java, by C Muthu, Second Edition, Vijay Nicole Imprints Private Limited.

(Chapters : 1 to 6, 16, 7, 8, 12 to 14, 18)

Model Question Paper

B.C.A. : III Year: Programming with Java

Time: 3 Hrs. **Max. Marks: 100**

SECTION – A

Answer ALL Questions : **10 x 2 = 20 M**

1.a) Java Virtual Machine.
b) What is the use of type Declaration Statements ?
c) What is a recursive method ?
d) Differentiate between instantiated and Static class members.
e) What is the advantage of Super keyboard ?
f) What is differences between extends and Implements ?
g) List any four methods of String Class.
h) What is Synchronization ?
i) What is the use of finally block ?
h) What is the purpose of Stream tokenizer class ?

SECTION – B

Answer ALL of the following questions: **4*20=80M**

2.a) Explain oops concepts in Java.
b) Write about input and output statements with example.
(OR)
c) Explain control statements with example each.

3.a) What are the differences between method overloading and method overriding?
b) Explain Types of constructors with examples.
(OR)
c) What is inheritance ? Explain types inheritances.
e) Write a program to implement multiple inheritance.

4.a) Explain how Packaging is done in Java.
e) Explain the life cycle of an Applet.
(OR)
f) Write a Java program to check the given string is Palindrome or not.
g) Explain how variables and methods in a package can be accessed from outside a package.

5.a) Write a short note on thread synchronization.
e) Write a program to create a file and write data from the keyboard into a file.
(OR)
f) What is Exception? Explain different types of exceptions in Java.
g) How do we establish a connection to a data table in oracle from a Java program?

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B.C.A: III Year: Web Technologies

UNIT-1

Introduction: HTML, XML, and the World Wide Web.

HTML: Basic HTML, The Document body, Text, Hyperlinks, Adding more formatting, Lists, Tables, Using colors and images, Images.

More HTML: Multimedia objects, Frames, Forms-towards interactivity, The HTML document Head in detail, XHTML- An evolutionary markup.

UNIT-2

Cascading Style Sheets: Introduction, Using styles: Simple examples, Defining your own styles, Properties and values in styles, Style sheets- A worked example, Formatting blocks of information, Layers.

An introduction to Java Script: What is dynamic html, Java Script, Javascript—The basics, Variables, String manipulation, Mathematical functions, Statements, Operators, Arrays, Functions.

Objects in Java Script: Data and objects in java script, Regular expressions, Exception Handling, Built in objects, Events.

UNIT-3

Dynamic HTML with Java Script: Data validation, Opening a new window, Messages and Confirmations, The status bar, Writing to a different frame, Rollover buttons, Moving images, Multiple pages in a single download, A text-only menu system, Floating logos.

Active Server Pages and Java: Active Server Pages, Java.

XML: Defining Data for Web applications: Basic XML, Document type definition, XML schema, Document Object Model, Presenting XML

UNIT-4

Good Design: Structure, Tables versus Frames, Accessibility, Internationalization, Exercises.

Useful Software: Web browsers, Perl, Web servers, mod_perl, Databases, Accessing your ISP, Exercises.

Protocols: Protocols, IP and TCP, Hyper Text Transfer Protocol, Common Gateway Interface, The Document Object Model, introducing the Document Object Model, Exercises.

Case Study: The plan, The data

Prescribed Book:

1. **Chris Bates, Web Programming Building Internet Applications, Second Edition, Wiley (2007)**

Model Question Paper
B.C.A. : III Year
Web Technologies

Time: 3 Hrs. **Max. Marks: 100**

Section-A

Answer all the following questions. Each question carries two marks.

1.

a) Distinguish between Internet and internet.
b) What is domain name?
c) What do you mean by home page?
d) What are class selectors?
e) What are clickable images?
f) Write sample code to make bold tag behave as if it is an italic tag.
g) What is the purpose of scripting languages? Give some examples of scripts.
h) List all the attributes of <body> tag.
i) How can we import style sheets into our web page?
j) Write the attribute that is used to display a linked page in the required frame?

Section-B

Answer all the following questions. Each question carries 20 marks.

2. a) Explain the features of a HTML program. Also, explain the structure of a HTML program.
b) Discuss the differences between style and formatting. Explain the tags in HTML supporting that.

(or)

c) What is the role-played by a multimedia object in designing the web page? Explain the procedure to include a multimedia object.
a) Discuss MIME.

3. a) What is the purpose of creating cascading style sheets? Explain the types of cascading style sheets.
b) List out the various operators available in Java Script with suitable examples.

(or)

c) How Java Script supports object orientation? Explain with an example.
d) What is an array? Discuss the structure of an array with an example. Also, explain how an array element can be removed.

4. a) Explain in detail Built in objects in Java script.
b) "Java script is an event – driven system". Justify ?

(or)

c) Create a simple form and write a script that performs primitive checking of data.
d) Explain Rollover Buttons in DHTML.

5. a) Explain Java Servlets.
b) Explain different ASP Objects.

(or)

c) Explain the structure of Document Object Model.
d) Explain Accessibility and internationalization.

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B.C.A: III Year: OPERATING SYSTEMS

UNIT-I

Introduction : Abstract Views of an Operating System, Goals of an OS, Operation of an OS, Preview of the Book

Overview of Operating Systems : OS and the Computer System, Efficiency, System Performance and User Convenience, Classes of Operating Systems, Batch Processing Systems, Multiprogramming Systems, Time Sharing Systems, Real Time Operating Systems, Distributed Operating Systems, Modern Operating Systems.

UNIT-II

Process and Threads : Process and Programs, Programmer View of Processes, OS View of Processes, Threads, Case Studies of Processes and Threads, Interacting Process – An Advanced Programmer View of Processes.

Scheduling : Preliminaries, Non-preemptive Scheduling Policies, Preemptive Scheduling Policies, Scheduling in Practice, Real Time Scheduling, Scheduling in Unix, Scheduling in Linux, Scheduling in Windows, Performance Analysis of Scheduling Policies.

UNIT-III

Memory Management : Managing the Memory Hierarchy, Static and Dynamic Memory Allocation, Memory Allocation to a Process, Reuse of Memory, Contiguous Memory Allocation, Noncontiguous Memory Allocation, Paging, Segmentation, Segmentation with Paging, Kernel Memory Allocation, A Review of Relocation, Linking and Program Forms.

Virtual Memory : Virtual Memory Basics, Demand Paging, Page Replacement Policies, Memory Allocation to a Process, Shared Pages, Memory Mapped Files, Unix Virtual Memory, Linux Virtual Memory, Virtual Memory in Windows, Virtual Memory Using Segmentation.

UNIT-IV

File Systems : File System and IOCS, Files and File Operations, Fundamental File Organizations, Directory Structures, File Protection, Interface between File System and IOCS, Allocation of Disk Space, Implementing File Access, File Sharing Semantics, File System Reliability, Virtual File System, Unix File System, Linux File System, Windows File System, Performance of File Systems.

Security and Protection : Overview of Security and Protection, Goals of Security and Protection, Security Attacks, Formal and Practical Aspects of Security, Encryption, Authentication and Password Security, Access Descriptors and the Access Control Matrix, Protection Structures, Capabilities, Unix Security, Linux Security, Windows Security.

Prescribed Book :

Operating Systems, A Concept –Base Approach, by D M Dhamdhere, Second Edition, Tata McGraw-Hill Publishing Company Limited.
(Chapters : 1 to 8)

Model Question Paper

B.C.A. : III Year: Operating Systems

Time: 3 Hrs. **Max. Marks: 100**

SECTION – A

Answer ALL Questions : **10 x 2 = 20 M**

1) Answer the following Questions : **10 x 2 = 20M**

a) Define the following:
i) System Call
ii) Semaphore
b) Difference between Multiprogramming and Multiprocessing.
c) Define Paging.
d) What is Dynamic Memory Allocation ?
e) What is PCB ?
f) What is Segmentation ?
g) What is meant by Dynamic Binding ?
h) Difference between Eipher Text, Plain Text
i) Define Encryption.
j) What is difference between Authentication, Authorization.

Section – B

4 x 20 = 80M

1. a) What is Scheduling ? Explain different Types of Scheduling.
b) What is the goals of an Operating System.
(or)
d) Explain following preemptive scheduling policies.
i) RR ii) LCN iii) STG iv) HRN

2. a) What is a Thread ? Explains three methods for implementing threads.
(or)
b) Explain following Non-preemptive scheduling policies
i) FCFS ii) SRN iii) HRN
c) What is a system call ? Explain with examples.

3. a) What are the Techniques that can be used to free the memory.
b) What is Page ? Explain about demand Paging.
(or)
c) What is Paging ? Explain Page Replacement Policies.
d) Explain unix virtual memory.

4. a) What is Encryption? Explain DES in detail ?
b) What are the goals of Security and Protection of an OS ?
(or)
c) What is a File ? Explain Operations on File.
e) Explain various levels of Directory structure.

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B.C.A: III Year: SOFTWARE ENGINEERING

UNIT-I

Introduction: The Software Engineering Discipline-Its Evolution and Impact, Software Development Projects, What is Wrong with the Exploratory Style of Software Development? Emergence of Software Engineering, Notable Changes in Software Development Practices, Computer Systems Engineering

Software Life Cycle Models: Why Use a Life Cycle Model? Classical Waterfall Model, Interactive Waterfall Model, Prototyping Model, Evolutionary Model, Spiral Model, Comparison of different Life Cycle Models

UNIT- II

Software Project Management: Responsibilities of a Software Project Manager, Project Planning, Metrics for Project Size Estimation, Project Estimation Techniques, Empirical Estimation Techniques, COCOMO – A Heuristic Estimation Technique, Halstead's Software Science – An Analytical Technique, Staffing Level Estimation, Scheduling, Organization and Team Structures, Staffing, Risk Management, Software Configuration Management, Miscellaneous Plans

Requirements Analysis and Specification: Requirements Gathering and Analysis, Software Requirements Specification (SRS), Formal System Specification, Axiomatic Specification, Algebraic Specification, Executable Specification and 4GL

UNIT-III

Software Design: Outcome of a Design Process, How can We Characterize a Good Software Design? Cohesion and Coupling, Layered Arrangement of Modules, Approaches to Software Design, Object-Oriented versus Function-Oriented Design Approaches

Function Oriented Software Design: Structured analysis, Data Flow Diagrams, Structured Design.

Coding and Testing: Coding, Code Review, Software Documentation, Testing, Testing in the Large versus Testing in the Small, Unit Testing, Black-Box Testing, White-Box Testing, Debugging, Program Analysis Tools, Integration Testing, Testing Object-Oriented Programs, System Testing, Some General Issues Associated with Testing.

UNIT-IV

Software Reliability and Quality Management: Software Reliability, Statistical Testing, Software Quality, Software Quality Management System, ISO 9000, SEI Capability Maturity Model, Personal Software Process (PSP), Six Sigma.

Computer Aided Software Engineering: Case and its Scope, Case Environment, CASE support in Software Life Cycle, Other Characteristics of CASE Tools, Towards Second Generation CASE Tool, Architecture of a CASE Environment.

Prescribed Book:

1. Fundamentals of Software Engineering, by Rajib Mall, Third Edition, PHI Learning Private Limited.
(Chapters : 1 to 5, 6.2,6.3,6.5, 10, 11, 12)

Model Question Paper

B.C.A. : III Year:Software Engineering

Time: 3 Hrs. **Max. Marks: 100**

SECTION – A

Answer ALL Questions : 10 x 2 = 20 M

1.a) Differentiate program and software product.
  b) What is Abstraction?
  c) Describe the importance of Project Planning.
  d) Explain the goals of requirement analysis?
  e) What are the components of DFD?
  f) What is Data Dictionary?
  g) What is the difference between problem statement and scope of a problem.
  h) Give the factors, determine the software quality.
  i) List out the advantages of CASE tools?
  h) What is Alpha Testing?

SECTION – B

Answer ALL Questions : 4 x 20 = 80 M

2.a) What do you understand by a program module? What are the important characteristics of a program module?
  b) What is computer systems engineering? How it is different from software engineering? Give example.

(or)

  c) What are limitations of the waterfall model? Suggest a life cycle model that overcomes those limitations. Explain.
  d) What is meant by software process? Explain the differences between the methodology and process with suitable example.

3.a) Explain the responsibilities of a software project manager.
  b) Discuss about COCOMO model.

(or)

  c) Discuss about different types of requirement gathering activities that analysts use to determine the requirements of a customer.
  d) Exlain about the characteristics of an SRS Document.

4.a) Develop an DFD to construct an Hospital Management System
  b) Explain about different types of couplings.

(or)

  c) What is the purpose of testing? Describe about different testing techniques.

5.a) Discuss about reliability metrics.
  b) What is statistical testing? Explain different steps involved in statistical testing?

(or)

  c) Explain about CASE Tools and its advantages in software development.
  d) Discuss about the features of ISO 9001 certification.

B.C.A: III Year: Data Communications

UNIT-I

Introduction: Data communications, Networks, The Internet, Protocols & Standards

Network Models: Layered Tasks, The OSI model, Layers in the OSI model, TCP/IP Protocol Suite, Addressing

Data & Signals: Analog & Digital, Periodic Analog signals, Digital signals, Transmission Impairment

UNIT-II

Digital Transmission: Digital-to-Digital Conversion, Analog-to-Digital Conversion, Transmission modes

Analog Transmission: Digital-to-Analog Conversion, Analog-to-Analog Conversion

Bandwidth Utilization: Multiplexing and Spreading: Multiplexing

UNIT-III

Transmission Media: Guided Media, Unguided Media: Wireless

Connecting LANs, Backbone Networks and Virtual LANs: Connecting Devices, Backbone Networks, Virtual LANs

Wireless WANs: Cellular Telephone and Satellite Networks: Cellular Telephony, Satellite Networks

UNIT-IV

Domain Name System : Name Space, Domain Name Space, Distribution of Name Space, DNS in the Internet, Resolution, DNS messages, Types of Records, Registrars, Dynamic Domain Name System (DDNS), Encapsulation

Remote Logging, Electronic Mail and File Transfer : Remote Logging, Electronic Mail, File Transfer

WWW and HTTP : Architecture, Web Documents, HTTP

Prescribed Book:

Data Communications and Networking, by Behrouz A Forouzan, Fourth Edition, The McGraw-Hill Companies (Special Indian Edition) (Chapters-1 to 7,15,16,25,26,27)

Model Question Paper

B.C.A. : III Year: Theory Paper-1

Data Communications and Networking

Time: 3 Hrs. **Max. Marks: 100**

SECTION – A

1. Answer ALL Questions : 10 x 2 = 20 M

a) Differentiate between logical address and Physical address.
b) What is the need for Multiplexing?
c) Write about cookies.
d) Explain network Criteria.
e) Difference between a hub & a repeater.
f) Define registrars
g) What are the phenomena's of light used for transmitting data in fiber optic cable?
h) Difference between orbit & footprint.
i) What are the protocols used in e-mail?
j) Differentiate between attenuation and distortion.

SECTION – B

Answer All Questions : 4 x 20 = 80 M

2. a. Explain OSI model and write the functions of each layer.
   b. Write about analog data and analog signals.
   (or)
   c. Briefly explain TCP/IP protocol suite.
   d. Write about digital data and digital signals.

3. a. Define Multiplexing and its types.
   b. Write about analog-to-digital conversion.
   (or)
   c. Write about digital-to-digital conversion.
   d. Explain Digital to analog conversion.

4. a. Explain about guided media.
   b. Explain the concept of virtual LANS.
   (or)
   c. Write about various connecting devices.
   d. Briefly explain Cellular telephony.

5. a. Describe DNS.
   b. Write about TELNET.
   (or)
   c. Write about WWW & HTTP.

III BCA: Proposed Lab Cycle: JAVA

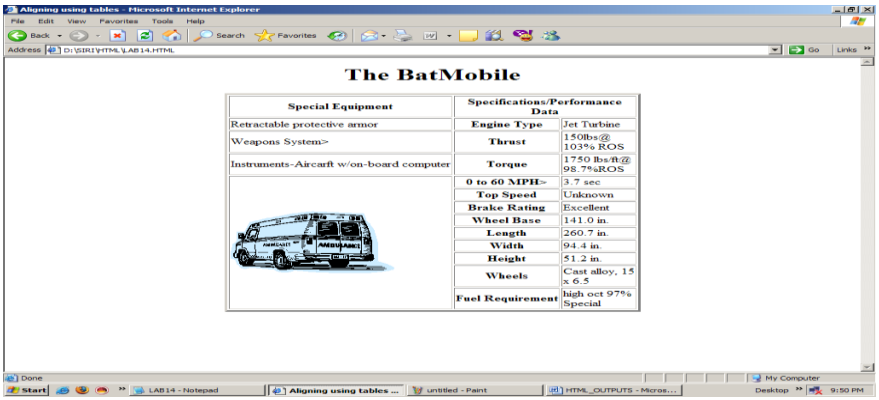
1. **Write a java program to determine the sum of the following harmonic series for a given value of 'n'.**
   1+1/2+1/3+. . . _1/n
2. **Write a program to perform the following operations on strings through interactive input.**
   a) Sort given strings in alphabetical order.
   b) Check whether one string is sub string of another string or not.
   c) Convert the strings to uppercase.
3. **Write a program to simulate on-line shopping.**
4. **Write a program to identify a duplicate value in a array.**
5. **Create two threads such that one of the thread print even no's and another prints odd no's up to a given range.**
6. **Define an exception called "Marks Out Of Bound" Exception, that is thrown if the entered marks are greater than 100.**
7. **Write a JAVA program to shuffle the list elements using all the possible permutations.**
8. **Create a package called "Arithmetic" that contains methods to deal with all arithmetic operations. Also, write a program to use the package.**
9. **Write an Applet program to design a simple calculator.**
10. **Write a program to read a text and count all the occurrences of a given word. Also, display their positions.**
11. **Write an applet illustrating sequence of events in an applet.**
12. **Illustrate the method overriding in JAVA.**
13. **Write a program to fill elements into a list. Also, copy them in reverse order into another list.**
14. **Write an interactive program to accept name of a person and validate it. If the name contains any numeric value throw an exception "Invalid Name".**
15. **Write an applet program to insert the text at the specified position.**
16. **Prompt for the cost price and selling price of an article and display the profit (or) loss percentage.**
17. **Create an anonymous array in JAVA.**
18. **Create a font animation application that changes the colors of text as and when prompted.**

19. Write an interactive program to wish the user at different hours of the day.

20. Simulate the library information system i.e. maintain the list of books and borrower's details.
21. Program to read employee details from employee table using Database connectivity.
22. Write a program to insert into details of employee into the table.
23. Write a java program to maintain employee payroll system by using databases.

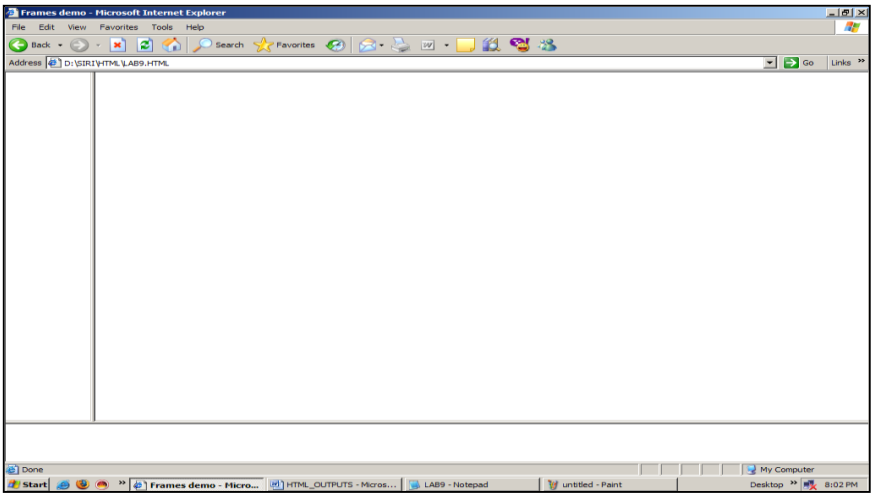
Web Technologies

1. Write a HTML program illustrating text formatting.
2. Illustrate font variations in your HTML code.
3. Prepare a sample code to illustrate links between different sections of the page.
4. Create a simple HTML program to illustrate three types of lists.
5. Embed a real player in your web page.
6. Embed a calendar object in your web page.
7. Create an applet that accepts two numbers and perform all the arithmetic operations on them.
8. Create nested table to store your curriculum.
9. Create a form that accepts the information from the subscriber of a mailing system.
10. Design the page as follows:

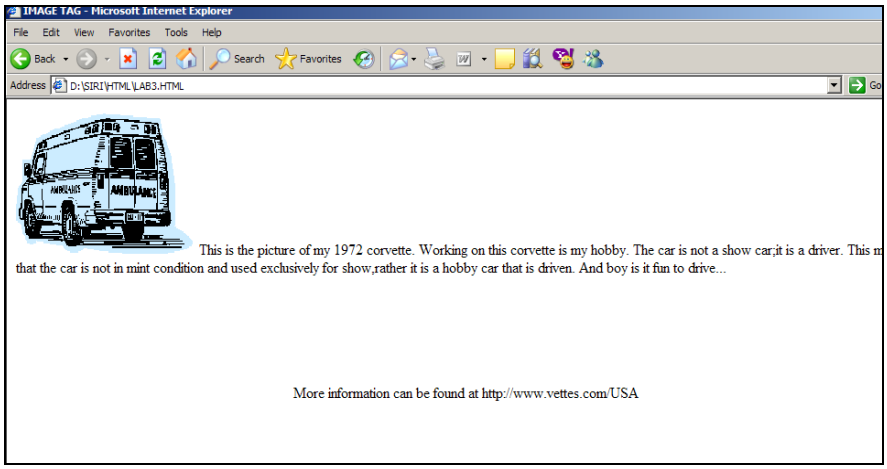


11. Using "table" tag, align the images as follows:

12. Divide the web page as follows:

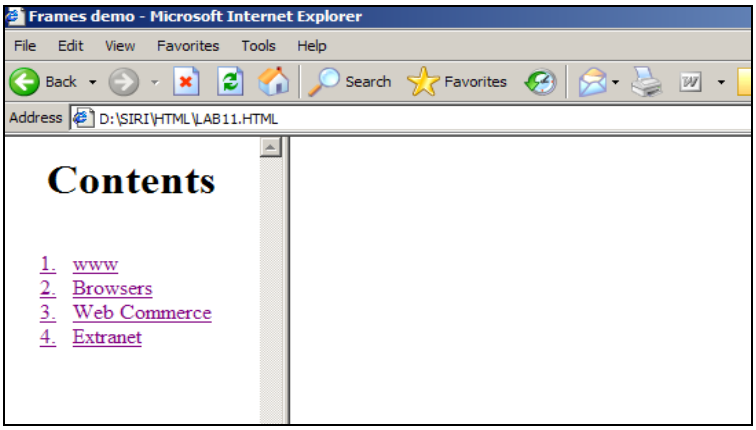


13. Design the page as follows:



14. Illustrate the horizontal rulers in your page.

15. Create a help file as follows:



16. Write a Java Script to accept the first, middle and last names of the user and print the name.

17. Evaluate the following:

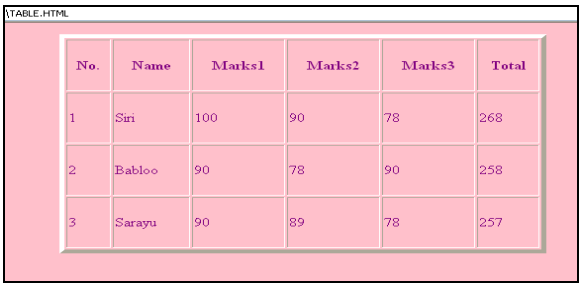
b) "10"+"90"

c) (10<8)>10:8

d) J=(i++)+(--i)+(++i)+(i++) where i=2

18. Write a Program in Java Script to add two numbers.
19. Write a script to find the factorial of a given number using functions.
20. Write a script to print all primes with in the given range.
21. Write a program to sort the array elements using "Bubble Sort" technique.
22. Write a program in Java Script to implement "Binary Search" technique.
23. Write a script to print all perfect numbers with in the given range.
24. Write a script to evaluate the following expression:
    1+2/2! +3/3! +……+n/n!
25. Write a program to implement "Stack" operations.
26. Write a script to print Fibonacci series recursive functions.
27. Using a ternary operator, write a script to validate the withdrawal transaction of a customer. If he with draws more than his balance, such a transaction should be disallowed.
28. Write a script to wish the user "Good Morning" at different hoursof the day.
29. Prompt the user for the cost price and selling price of an article and output the profit or loss percentage.
30. Create a customer profile for data entry of customers in a hotel. The profile should prompt for the name, address, gender, age, room type, mode of payment of the customer.
31. Create a student registration system with the following fields: Name, Regdno, Gender, street, city, state, pincode, stdcode, phone, dbirth, college, experience, course code. Create a main object called "Stu_info" with all the fields and "College" and "Experience" as sub objects with in the main object. Create separate object definition for College and Experience with the following fields:
    College: Name, Location, Degree

    Experience: Employer, Location, Duties and Period
32. Write a script to read information of 'n' students from the user and store them into the table as follows:



No.	Name	Marks1	Marks2	Marks3	Total
1	Siri	100	90	78	268
2	Babloo	90	78	90	258
3	Sarayu	90	89	78	257

33. Write the script for the various validations given below:
    a. Candidate code should be generated
    b. Date of Birth should not be null and age should be more than 21.
    c. All alphabet fields should be validated.
    d. All number fields should accept only numbers.
    e. Total experience should be calculated and displayed after accepting input for the "From" and "To" fields in the table.

34. Create a bio-data format with the following fields:

    Name, candidate code, Date of birth, Gender, Address1, Address2, Phone, Passport number, Qualification and Percentage.

    Also, create the following fields for entering present employment details:

    Company name Company Address1, Address2, Address3, Phone, Fax, E-mail, Total Experience and Project details.

    Create a table with the columns given below in a 3 row structure:
    Employer name, Location, From, To, Field

35. Create a web page for a shopping mall that allows the user to tick off his purchases and obtain a bill with the total being simultaneously added up. The web page must follow the specifications as given below:

    a. The entire web page must be divided into four portions. The top most portion states the name of the mall, the middle portion of the web page is divided vertically into two, the types of the items available in the mall are displayed on the left side and a detailed description of each item with the prices are available on the right. Finally, the bottom most portion of the web page must display the cash memo with the total along side.

    b. Each item in the left hand frame must have a link to the file containing its detailed description, which must be displayed in the right hand frame. Ensure that the user is able to perceive only that portion of the file that is related to the item on which he clicked. Prior to the link being activated, the right hand frame must display a friendly message that gives an idea about its latter contents.

36. Design a simple calculator.
37. Write a DHTML program to give different colors for different heading tags.
38. Using DHTML, invert the behavior of <h1> to <h6> tags.
39. Create an inline style sheet for your web page.
40. Create an external style sheet for creating a font family.
41. Illustrate the creation of embedded style sheet.
42. Illustrate the procedure of creating user-defined classes.
43. Write an ASP script to send the information accepted from the user and send it to a CGI script.
44. Write an ASP script to update the student information with some number 'n' in the table.
45. Delete the desired student's record from the table using the ASP Script.