DESIGN AND ANALYSIS OF ALGORITHM LAB

[As per Choice Based Credit System (CBCS) scheme]
(Effective from the academic year 2018-2019)
SEMESTER – IV

Subject Code	18CSL/ISL47	**CIE Marks**	50
Number of Lecture Hours/Week	02	**SEE Marks**	50
Total Number of Lecture Hours	48	**Exam Hours**	03

CREDITS – 01

Course objectives: This course will enable students

- Design and implement various algorithms in JAVA
- Employ various design strategies for problem solving.
- Measure and compare the performance of different algorithms.

PART – A

1. Design a program to search a key element of n integers using binary search algorithm and compute time complexity
2. Design a program to Sort a given set of n integer elements using Quick Sort method and compute its time complexity.
3. Design a program to sort set of n integer elements using Merge Sort method and compute its time complexity.
4. Implement the 0/1 Knapsack problem using
   (a) Dynamic Programming method.
   (b) Greedy method.
5. Design a program to print all the node reachable from a given starting node in a given digraph using DFS method.

PART – B (Implement the following in JAVA)

1. Write a Program find shortest paths to other vertices using Dijkstra's algorithm.
2.
   (a) Write a program to find a Minimum Cost Spanning Tree of a given connected undirected graph using Kruskal's algorithm.
   (b) Write a program to find Minimum Cost Spanning Tree of a given connected undirected graph using Prim's algorithm.
3. Write a program to
   (a) Implement All-Pairs Shortest Paths problem using Floyd's algorithm.
   (b) Implement transitive closure using warshall Algorithm.
4. Design and implement to find a subset of a given set.
5. Implement Travelling Salesman problem using Dynamic program.

Course Outcomes

The students should be able to:
CO 1: Design algorithms using appropriate design techniques (brute-force, greedy, dynamic programming, etc.)
CO 2: Develop variety of algorithms such as sorting, graph related, combinatorial, etc., in a high level language.
CO 3: Analyze and compare the performance of algorithms using language features.
CO 4: Apply and implement learned algorithm design techniques and data structures to solve real-world problems. Will be able to do Basic System administration.

JAVA PROGRAMMING LAB

[As per Choice Based Credit System (CBCS) scheme]
(Effective from the academic year 2018-2019)
SEMESTER – IV

Subject Code	18CSL/ISL46	**CIE Marks**	50
Number of Lecture Hours/Week	02	**SEE Marks**	50
Total Number of Lecture Hours	48	**Exam Hours**	03

CREDITS – 01

Course objectives: This course will enable students

- Learn fundamental features of object oriented language and JAVA
- Set up Java JDK environment to create, debug and run simple Java programs.
  Learn object oriented concepts using programming examples

PART – A

1. a. Write a JAVA program to implement class mechanism. –Create a class, methods and invoke them inside main method.
   b. Write a JAVA program to implement shift operators in JAVA
2. a. Write a JAVA program to implement constructor overloading.
   b. Write a JAVA program to implement for-each loop to compute average of n natural numbers.
3. a. Write a JAVA program to implement multi level Inheritance.
   b. Write a JAVA program for abstract class to find areas of different shapes.
4. a. Write a JAVA program that describes exception handling mechanism.
   b. Write a JAVA program to implement break and continue statements.
5. a. Write a JAVA program using IO Streams.
   b. Write a JAVA program using files.

PART – B (Implement the following in JAVA)

1. Write a JAVA program that creates threads by extending Thread class .First thread display "Good Morning "every 1 sec, the second thread displays "Hello "every 2 seconds and the third display "Welcome" every 3 seconds,(Repeat the same by implementing Runnable.
2. Write a JAVA program Producer Consumer Problem.
3. Write a JAVA program to create an applet and set its background color and foreground color displaying a message
4. A. Write a JAVA program to demonstrate key event handlers using delegation event model.

The students should be able to:
CO 1: Implement the java program using constructor, inheritance.
CO2: Implement the java program using exception handling.
CO2: Implement the java program using threads.

MICROPROCESSOR AND MICROCONTROLLER LAB

[As per Choice Based Credit System (CBCS) scheme]
(Effective from the academic year 2018-2019)
SEMESTER – IV

Subject Code	18CSL/ISL45	**CIE Marks**	50
Number of Lecture Hours/Week	02	**SEE Marks**	50
Total Number of Lecture Hours	48	**Exam Hours**	03

CREDITS – 01

Course objectives: This course will enable students to

- Demonstration and Explanation of hardware components ,8086 architecture, pin diagram
- Develop and execute the following programs using 8086 Assembly Language. Any suitable assembler like MASM/TASM/8086 kit or any equivalent software may be used.

Laboratory Session-1: Write-up on Microprocessors, 8086 Functional block diagram, Pin diagram and description. The same information is also taught in theory class; this helps the students to understand better

Laboratory Session-2: Write-up on Instruction group, Timing diagrams, etc. The same information is also taught in theory class; this helps the students to understand better.

Note: These TWO Laboratory sessions are used to fill the gap between theory classes and practical sessions. Both sessions are to be evaluated for 20 marks as lab experiments.

PART – A

1. Design and develop an assembly language program to search a key element "X" in a list of 'n' 16-bit numbers. Adopt Binary search algorithm in your program for searching.
2. Design and develop an assembly program to sort a given set of 'n' 16-bit numbers in ascending order. Adopt Bubble Sort algorithm to sort given elements.
3. Design and develop an assembly language program to read the current time and Date from the system and display it in the standard format on the screen.
4. Develop an assembly language program to reverse a given string and verify whether it is a palindrome or not. Display the appropriate message.
5. Design an assembly language program to compute nCr using recursive procedure. Assume that 'n' and 'r' are non-negative integers.
6. Design an assembly language program to create a file and delete an existing file.
7. To write and simulate C Program to ARM microprocessor using KEIL. (Demonstrate with the help of suitable program)

PART – B

1. Design and develop an assembly program to read the status of two 8-bit inputs (X & Y) from the Logic Controller Interface and display X*Y.
2. Design and develop BCD Up-Down counter using Logic Controller Interface.
3. Design and develop an assembly program to display messages "FIRE" and "HELP" alternately with flickering effects on a 7-segment display interface for a suitable period of time.
4. To interface stepper motor with ARM processor- ARM7TDMI/LPC2148. Write a program to rotate stepper motor.

Course Outcomes

The students should be able to:
CO 1: Program a microprocessor to perform arithmetic, logical and data transfer applications.
CO 2: Understand assembler directives, DOS Interrupts, branch and loop operations.