23CSVAL101: Problem Solving Techniques

Offered to Programmes: B. Sc Honorus (Electronics),

Course Type: Value -Add Course

Course Description: This course focuses on familiarising students in logic development and writing algorithms. It also focuses on making students familiar with Raptor tool for interpreting flowchart.

Course Objects:

1. To learn about basic problem solving techniques

2. To solve given logical problems using algorithms and flowcharts.

Course Outcomes: At the end of the course, students will be able to:

CO1: To learn designing of algorithms and flow charts. (PO5, PO6, PO7)

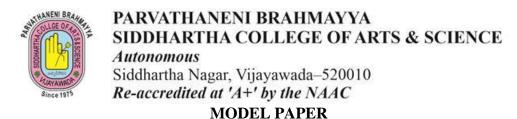
CO2: To learn basics of logic development. (PO5, PO6, PO7)

SYLLABUS		
UNIT	TOPICS	Lecture Hrs.
I	Steps Involved in Computer Programming –Problem Definition – Outlining The Solution –Flow Chart – Developing Algorithms – Efficiency of Algorithms - Analysis of Algorithms. Exchanging the Values –Counting – Summation of Set of Number - Factorial Computation.	5
II	Fibonacci Sequence – Reversing the Digits of an Integer, Finding the Square Root of a Number –Smallest Divisor of an Integer – GCD of Two Integers –Generating Prime Numbers –Computing the Prime Factors of an Integer – Raising a Number to a Large Power –Computing the Nth Fibonacci Number.	5
III	Array Order Reversal – Array Counting, Finding the Maximum and Minimum Number in a Set, binary search – Linear Search. Raptor (Flowchart Interpreter): Introduction to Raptor, Description of Raptor, Advantages of Raptor, Drawing flow charts using Raptor.	5

TEXTBOOK

Dromey R G, "How to Solve it by Computer", Prentice Hall of India, 1997

Course has focus on: Skill Development Websites: https://raptor.martincarlisle.com/



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Offered to B. Sc. Hons (Electronics)

Max: 35 Marks Time: 120 Min

Section-A

Answer any **THREE** from the following

 $3 \times 5 = 15 \text{ Marks}$

- 1. Develop an algorithm to swap two numbers without using third variable. (CO1, L6)
- 2. Develop an algorithm to print factorial of given number. (CO1, L6)
- 3. Develop an algorithm to print prime factors of an integer. (CO2, L6)
- 4. Develop an algorithm to calculate square root of given number. (CO2, L6)
- 5. Develop an algorithm to count number of unique elements in given array. (CO3, L6)

Section-B

Answer any **TWO** from the following

 $2 \times 10 = 20 \text{Marks}$

- 6. Discuss steps involved in computer programming. (CO1, L1)
- 7. Develop an algorithm for
 - a) Reversing the digits of an integer 5M
 - b) Computing Nth Fibonacci number. 5M (CO2, L6)
- 8. Demonstrate binary search using following data set and keys.: (CO3, L6)

A=[10,15,25,35,65,70,80]

Case 1: Key - 10; Case 2: Key - 35 Case 3: Key - 85

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