

B.Tech I Year (R13) Supplementary Examinations December/January 2014/2015  
**PROBLEM SOLVING & COMPUTER PROGRAMMING**  
 (Computer Science and Engineering)

Time: 3 hours

Max. Marks: 70

**PART – A**  
 (Compulsory Question)

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- 1 Answer the following: (10 X 02 = 20 Marks)
- Give brief description about the general problem solving strategies.
  - Write a program that reads nine integers and prints them three in a line separated by commas.
  - What is an expression? Give brief description about the different types of expressions.
  - Given a set of n numbers design an algorithm that adds these numbers and returns the resultant sum. Assume n is greater than or equal to zero.
  - Given an integer n devise an algorithm that will find its smallest exact divisor other than one.
  - What is top – down design? Illustrate it with the help of a diagram.
  - With the help of neat sketch, explain the bitwise shift – right operator.
  - Draw and explain the truth table for bitwise exclusive OR operator.
  - Explain the node structure of a single linked list.
  - Give brief description about the block memory allocation technique.

**PART – B**  
 (Answer all five units, 5 X 10 = 50 Marks)

**UNIT - I**

- Explain in detail about the system development life cycle.
  - What is an identifier? What are the rules that should be followed for defining the identifiers?

OR
- Write a program that prompts the user to enter an integer and then prints the integer first as a character, then as a decimal and finally as a float.
  - What are the major computer hardware components? Explain them.

**UNIT - II**

- What is type conversion? Explain the different types of conversion in detail.
  - Write a program to print the Fibonacci sequence of any given number.

OR
- With the help of a flowchart and syntax explain the for loop.
  - Write a program to calculate the GCD of given two numbers.

**UNIT - III**

- What is an array? Explain the one dimensional array with suitable example program.
  - Design an algorithm that rearranges the elements in an array so that they appear in reverse order.

OR
- Given a randomly ordered array of n elements determine the k<sup>th</sup> smallest element in the set.
  - What is a function? In how many ways the arguments can be passed to the function? Explain them in detail.

**UNIT - IV**

- Discuss in detail about the various string manipulation functions
- OR
- What is a structure? Explain how it differs from arrays.
    - What is a mask? Explain the one bit and two bit masks with suitable examples.

**UNIT - V**

- What are the different possible positions that a node can be deleted from a single linked list? Explain them in detail.
- OR
- Explain in detail about the various types of standard input and output functions

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