

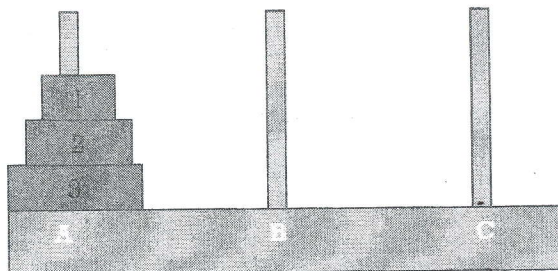


EASTERN UNIVERSITY, SRI LANKA
DEPARTMENT OF MATHEMATICS
SECOND EXAMINATION IN SCIENCE (2015/2016)
FIRST SEMESTER (Nov./ Dec., 2017)
CS 251 – PRACTICAL WORK ON CS 201

Answer All Questions

Time Allowed: Two Hours

- 1) Write a C++ program to read a sequence of 20 integer numbers and sort them using merge sorting technique. Push the even numbers in the sorted list into a queue and print the contents of queue.
- 2) You are given a set of three pegs and n disks, with each disk a different size. Let's name the pegs A, B, and C, and let's number the disks from 1, the smallest disk, to n the largest disk. At the outset, all n disks are on peg A, in order of decreasing size from bottom to top, so that disk n is on the bottom and disk 1 is on the top. Here's what the Towers of Hanoi looks like for $n = 3$ disks:



The objective of the Towers of Hanoi is to move the entire stack to another peg, obeying the following simple rules:

- i. Only one disk can be moved at a time.
- ii. Each move consists of taking the upper disk from one of the pegs and placing it on top of another peg.
- iii. No disk may be placed on top of a smaller disk.

Write a C++ program to implement Towers of Hanoi using recursion technique.

3) Write a C++ program to evaluate the postfix expression using stack. Create a class with the name *ADTStack* and define the following methods with the corresponding names.

To create a stack. (*ADTStack()*)

To check whether a stack is empty or not (*bool IsEmpty()*)

To check whether a stack is full or not (*bool IsFull()*)

To push an element into the stack (*void Push(int c)*)

To delete an element from the stack (*int Pop()*)

To return the top element of the stack (*int Peek()*)

Eg: Input: 2 3 4 + * 6 -

Output: 8