

M.C.A. DEGREE I SEMESTER EXAMINATION, NOVEMBER 2005

CAS 2103 DATA STRUCTURES WITH 'C'

Time : 3 Hrs.

Maximum Marks : 50

PART - A

(Answer ALL questions)(Each question carry TWO marks)

(15 x 2 = 30)

- I a) What are 'l' values and 'r' values? Give examples.
 b) int $Z1 = 12, Z2 = 6$. Evaluate the following
 (i) $Z1$ and $Z2$ (ii) $Z1/Z2$ (iii) $Z1 \wedge Z2$
 c) Write a program to add all integer numbers from 0 to 100, excluding numbers that are multiple of 11.
- II a) Convert the following infix expressions to post fix
 (i) $A+B*C-D/E$ (ii) $A*B-(C+D)+E$
 b) Evaluate the following prefix expression (All digits are single digits)
 $- + * 9 + 2 8 * + 4 8 6 3$
 c) Write an implementation of a stack using array.
- III a) Write a representation of sparse matrix using linked list.
 b) What functions are available in 'C' for dynamic memory allocation and deallocation? Explain their use.
 c) How a linked list is represented by an array? Explain.
- IV a) What is a 2-3-4 tree? Give an example.
 b) Explain how trees will be useful in spell checking.
 c) Explain the use of threaded binary tree.
- V a) Explain the use of reverse polish notation.
 b) How will you evaluate a postfix expression?
 c) What is the run time complexity of above algorithm?

PART - B

(Answer ALL questions)(Each question carry FOUR marks)

(5 x 4 = 20)

- VI A Explain using examples, the scope and storage classes of objects used in C.
 OR
 VI B Write a complete C program to count the number of blank spaces of a given input sentence.
- VII A Given two sorted lists L_1 and L_2 . Write a function to compute $L_1 \cup L_2$ and $L_1 \cap L_2$ using only the basic list operations.
 OR
 VII B Write the routines to implement queues using linked list.
- VIII A Write a function to add two polynomials. Do not destroy the input. Use a linked list implementation.
 OR
 VIII B Write the routines to implement queues using linked lists.
- IX A Explain basic operations on B-trees. Show all legal B-trees of minimum degree 2 that represent $\{1, 2, 3, 4, 5\}$.
 OR
 IX B Describe traversals of a threaded binary tree using examples.
- X A Explain expression trees. Write a function for infix expression tree traversal.
 OR
 X B Write a program to convert an infix expression which includes '(', ')', '+', '-', '*', '/' and '/' to postfix.