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B. C. A. (Sem. III) Examination

April/May-2005

Data Structures : Paper - 303

Time : 3 Hours] [Total Marks : 70

Instructions :

(1)

નીચે દર્શાવેલ વિગતો ઉત્તરવહી પર અવશ્ય લખવી. Mention below given details in Answer Book

Name of the Examination :

B.C.A. (Sem. III)

Name of the Subject :

Data Structures : Paper - 303

Subject Code No. : 6 2 3 ☐ Section No. (1, 2) : Nil

Seat No. : ☐☐☐☐☐☐

Student's Signature

Instructions : (1) Question 1 is compulsory.

(2) Mention your options clearly.

(3) Figures on the right indicate full marks.

(4) This question paper contains 5 questions.

1 Answer the following : (any seven) 14

(a) Distinguish between actual and formal arguments in functions.

(b) Distinguish between $(*m)[5]$ and $(*n)[5]$.

(c) Give the storage representation of Integer and real numbers with example.

(d) What is Data Structure ? Distinguish primitive and non-primitive data structure.

(e) What is the condition of overflow in simple queue ? How circular queue is better ?

(f) Write the best average and worst case complexities of bubble sort and insertion sort.

(g) Define m-ray tree. When an m-ary tree will be complete binary tree.

(h) What do you mean by polish and reverse polish notation ?

2 (a) Write a note on user defined functions. 4

(b) Write a function using pointess to add two matrices and to return the resultant matrix to the calling function. 6

(c) Declare pointer to the integer and use it instead of the one-dimensional array of integers having to elements. Print sum of all 10 integers. 4

OR

2 (a) Write a program using pointers to read in an array of integers and print its elements in reverse order 5

(b) Write a program to read data from keyboard write it to a file named "input". Again read the same data from the "input" file and display it on the screen. 5

(c) Write the output of the following : 4

(i)
```
# include, <studio.h>
void main ( )
{
   int a[5] = {1,2,3,4,5};
   printf ("%d\t %d", *a, *(a+3));
}
```

(ii)
```
# include <stdio.h>
void main ( )
{
   int n=5, *p, **q;
   p = &n;
   q = &p;
   print f ("%d\t% d\t %d", *(&n), *p, **q);
}
```

3 (a) What are the various application of stack, explain in brief. Write an algorithm to convert a given infix expression into prefix expression. 8

(b) Define Deque. Write an algorithm to perform input and output operations on input restricted Deque. 6

OR

3 (a) Define stack. Write algorithms to perform various operations on stack. 6

(b) How is circular queue different from simple queue ? Write algorithms to perform input and output operations on simple queue as well as circular queue. 8

4 (a) Define Doubly circular linked list. Write an algorithm to insert an element between two given nodes of Doubly linked list. 6

(b) Define Binary Search. Write an algorithm to create a binary tree of ordered names. 8

OR

4 (a) Explain Quick sort with example. 8

(b) Write an algorithm or program to construct polynomial $5x^3 + 2xy + 6y^2$ and display it. 6

5 Write short note : (any four) 14

(a) Simulation

(b) 2-3 tree and weight balanced tree

(c) Tree traversals

(d) Recursion

(e) Stack and its application.