

Total No. of Questions : 8]

SEAT No. :

**P1025**

**[4457]-224**

[Total No. of Pages : 2

**S.E. (I.T.)**

**FUNDAMENTALS OF DATA STRUCTURES**

**(2012 Pattern) (214444) (Semester -I)**

*Time : 2 Hours]*

*[Max. Marks :50*

*Instructions to the candidates:*

- 1) *Answer four questions.*
- 2) *Figures to the right indicate full marks.*
- 3) *Assume suitable data, if necessary.*

- Q1)** a) Differentiate between structure and union. [3]  
b) Explain logical operators in C. [3]  
c) Describe following declarations [6]  
i) `int *A[10];`    ii) `charN[10][50];`    iii) `void *f(int a[], int n);`  
iv) `float *p;`    v) `double **p;`    vi) `FILE *fp1;`

OR

- Q2)** a) Explain call by value and call by reference with suitable example. [6]  
b) Write pseudo C algorithm to reverse a string. [3]  
c) Differentiate between binary and text file. [3]

- Q3)** a) Give classification of data structures with one example of each type.[6]  
b) Sort the following list using selection sort. Show output of each pass and write time complexity. 10,6,13,7,5,51,27,2,3,15,-3,4. [6]

OR

- Q4)** a) Write Pseudo C code for binary search and analyze its time complexity. [6]  
b) What is frequency count? Write its importance in analysis of algorithm. Find time complexity of an algorithm to find union of two sets of length m and n. [6]

**P.T.O.**

- Q5)** a) Represent sparse matrix using suitable data structure and write simple/slow transpose algorithm. [5]  
 b) Explain use of stack in recursion. Write recursive function to find factorial of a positive number. [5]  
 c) Represent following polynomial using arrays. Write data structure declaration.  $5x^2y^3 + 3x^2 + 4xy + 2$ . [3]

OR

- Q6)** a) Write an algorithm to add two sorted polynomials in single variable. Analyze its time complexity. [7]  
 b) Give row major storage representation for two dimensional array. Write address calculation. [4]  
 c) Write disadvantages of sequential memory organization. [2]

- Q7)** a) Write a C function to reverse a linear singly linked list by changing link pointers. Write its time complexity. [6]  
 b) Write node structure and represent following polynomial using generalized linked list.  $5x^2y^3 - 3x^2y^2 + 2x + 4$ . [4]  
 c) Write advantages of linked memory organization. [3]

OR

- Q8)** a) What is doubly linked list? Write C code to [5]  
 i) delete a node pointed by pointer *temp* in a circular DLL.  
 ii) insert a new node pointed by pointer *newp* after a node pointed by pointer *temp* in circular DLL.  
 b) What is generalized list? Represent following list using GLL. [4]  
 (a,b,c,(e,f,g),h)  
 c) Write importance of header node in a linked list. [2]  
 d) Compare linear and circular linked list. [2]

