

Total No. of Questions—12]

[Total No. of Printed Pages—4+1

[3662]-212**S.E. (I.T.) (I Sem.) EXAMINATION, 2009****FUNDAMENTAL OF DATA STRUCTURE****(2008 COURSE)****Time : Three Hours****Maximum Marks : 100**

- N.B. :—**
- (i) Answer any *three* questions from each Section.
 - (ii) Answers to the two Sections should be written in separate answer-books.
 - (iii) Figures to the right indicate full marks.
 - (iv) Assume suitable data, if necessary.

SECTION I

1. (a) What is similarity between structure, union and enumeration ? [6]
- (b) What is Macro ? What are its advantages and disadvantages. [6]
- (c) Write C program to interchange two variables without using third variable. [4]

Or

2. (a) Describe about storage allocation and scope global, extern, static, local and register variables. [8]
- (b) What do you mean by type-definition ? Explain with suitable example. [4]

P.T.O.

(c) Determine output of the following C statement : [4]

(i) main ()

```
{    int x = 10, y = 5, p, q;
    p = x > 9;
    q = x > 3 & & y != 3 ;
    printf (" p = %d, q = %d ", p, q) ;
}
```

(ii) main ()

```
{    int x ;
    x = - 3 + 4 - 7 * 8/5 % 10 ;
    printf (" x = %d ", x) ;
}
```

3. (a) Define Pointers ? How do we declare the pointers ? Give its advantages. [6]

(b) Differentiate between pass by reference and pass by value. [4]

(c) Explain the effect of the following statements : [6]

(i) int p, * p ;

(ii) int q, * p = & q ;

(iii) int (* p) + + ;

(iv) int p + + ;

(v) char * p ;

(vi) int a = * p + 5 ;

Or

4. (a) What is difference between null pointer and null macro ? [6]
(b) What are pointers really good for ? [4]
(c) What is recursion ? Explain with example. [6]
5. (a) Define time and space complexity of an algorithm. [6]
(b) Explain with example linear data structure. [6]
(c) Define the following terms : [4]
(i) Data object
(ii) Data type.
(d) What is an abstract data type ? [2]

Or

6. (a) Define data structure. What are different types of data structure ? Explain. [8]
(b) Explain different asymptotic notation. [4]
(c) What do you mean by frequency count and its importance in the analysis of an algorithm. [6]

SECTION II

7. (a) Compare the selection sort and insertion sort with respective to : [8]
(i) Time complexity

- (ii) Passes
- (iii) Storage requirement
- (iv) Sort stability.

(b) Sort the following data in ascending order using quick sort.
Show all passes with pivot :

56, 12, 84, 56, 28, 0, -13, 47, 94, 31. [8]

Or

8. (a) What are different applications of sorting methods. [6]
(b) Write pseudo code for binary search with recursion. [6]
(c) What is bubble sort ? Explain with example. [4]

9. (a) What is sparse matrix ? What are its applications. [6]
(b) Represent the following polynomials using arrays :
(i) $x^3 + 2xy + y^3 - y + x$
(ii) $5x^2 - 10xy + y^2 - 20$. [4]
(c) Write a short note on Storage representation of order list. [6]

Or

10. (a) Write pseudo C algorithm for addition of two polynomials. [8]
(b) Explain with example simple and fast transpose. [8]
11. (a) Write C pseudo code to insert and delete an element from singly linked list. [6]

- (b) Compare linked list with arrays with reference to the following aspects :
- (i) accessing any element randomly
 - (ii) insertion and deletion of an element
 - (iii) utilization of computer memory. [6]
- (c) Discuss the applications of circular singly linked list in detail. [6]

Or

12. (a) Write comparison between sequential linked organization with linked organization. [6]
- (b) Represent the following GLL :
- (i) $G = ((a, b), ((c, d), e))$
 - (ii) $(p, q, (r, s, (t, u, v), w) x, u)$. [6]
- (c) Write C function that removes all duplicates elements from SLL. [6]