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[4757]-1084

S.E. (I.T.) (First Semester) EXAMINATION, 2015

FUNDAMENTALS OF DATA STRUCTURES

(2012 PATTERN)

Time : Two Hours

Maximum Marks : 50

N.B. :— (i) Attempt Q. No. 1 or Q. No. 2, Q. No. 3 or Q. No. 4,

Q. No. 5 or Q. No. 6, Q. No. 7 or Q. No. 8.

(ii) Neat diagrams must be drawn wherever necessary.

(iii) Figures to the right indicate full marks.

(iv) Assume suitable data if necessary.

1. (a) Explain various bitwise operators in C. Give example of each operator. [4]

(b) Illustrate the difference between Union and Structure with suitable example. [4]

(c) Write a C program to swap two numbers using call by reference. [4]

P.T.O.

Or

2. (a) What is pointer variable ? Explain declaration, initialization and accessing a pointer variable with an example. [4]
- (b) Explain arrays with example. [4]
- (c) Explain if and switch-case decision control statement. [4]
3. (a) Define the following terms with example : [6]
- (i) Data object
- (ii) Data structure
- (iii) Data type
- (b) Sort the following and show the status of every pass using selection sort 34, 9, 78, 65, 12, -5. [6]

Or

4. (a) Compare linear and non-linear, static and dynamic, primitive and non-primitive data structure. [6]
- (b) Sort the following data to ascending order using quick sort. Show all passes with pivot : 17, 8, -9, 2, 0, -5, 7, 20, 11, 15. [6]

5. (a) Define polynomial. Represent the following polynomial using array : [7]

(i) $x^3 + x^2 + x + 16$

(ii) $x^5y^4 + x^3y^3 + x^2 + y^2 + 10$

- (b) Explain simple and fast transpose of a sparse matrix with example. [6]

Or

6. (a) Explain sequential memory organization with example. [6]

- (b) Explain the two-dimensional array in detail with column and row major representation and address calculation in both the cases. [7]

7. (a) What are the advantages of linked list over array ? Describe different types of linked list. [7]

- (b) Write a C function to perform the following operation on SLL : [6]

(i) Insert element at any position

(ii) Reverse the list without using any DS.

Or

8. (a) Write C function to delete any node in case of DLL. [6]

(b) Explain the concept of GLL and represent the following GLL : [7]

(i) $((a, b), (c, d), e)$

(ii) $(a, (b, c), d)$