



DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
B.TECH. SEMESTER IV [INFORMATION TECHNOLOGY]
SUBJECT: Data Structure & Algorithm/Codes (DSA)

Examination	: Second Sessional	Seat No.	:
Date	: 18/02/2016	Day	: Thursday
Time	: 11 to 12:15	Max. Marks	: 36

INSTRUCTIONS:

1. Figures to the right indicate maximum marks for that question.
 2. The symbols used carry their usual meanings.
 3. Assume suitable data, if required & mention them clearly.
 4. Draw neat sketches wherever necessary.
-

- Q.1 Do as directed. [12]
- (a) If the number of record to be sorted large and the key is short, then sorting can be efficient. 1) Merge 2) Heap 3) Radix 4) Bubble [1]
- (b) Which of the following is not an in-place sorting algorithm? [1]
1) Selection sort 2) Heap sort 3) Quick sort 4) Merge sort
- (c) Which of the following is not a comparison sort? [1]
1) Selection sort 2) Merge sort 3) Quick sort 4) Radix sort
- (d) Consider the situation in which assignment operation is very costly. Which of the following sorting algorithm should be performed so that the number of assignment operations is minimized in general? 1) Insertion sort 2) Selection sort 3) Bubble sort 4) None [1]
- (e) The minimum number of comparisons needed by any comparison-based sorting algorithm is [1]
1) (n) 2) (n log n) 3) (n²) 4) None of the given
- (f) The running time of quick sort largely depends on [1]
1) number of inputs 2) selection of pivot element 3) size of elements 4) space available
- (g) Traversal of binary tree generate following in order sequence: D B E A F C [2]
and Preorder sequence: A B D E C F. Based on that draw a Binary tree for the same.
- (h) Which of the BST tree traversal technique will generate outputs in sorted order? [1]
- (i) Draw the tree for the following sequence (A(B(E(K,L),F),C(G),D(H(M),I,J))). Convert it into [3]
binary tree and write in order, preorder and post order for the same.
- Q.2 Attempt *Any Two* from the following questions. [12]
- (a) Write an algorithm/Code to insert a Right node in Threaded Binary Tree [6]
- (b) Write an algorithm/Code to traverse Binary Tree using In-order preorder and post-order. [6]
- (c) Write an algorithm/Code to insert a node in Binary Search Tree. [6]
- Q.3 (a) Show the structure of records, generated by the “table sort “ on following data. Next show the output configurations after each pass, when trying to physically rearrange records . [1+3]
Data :- “ 30,20,10,40,60,50,70,80,100,90”
- (b) Write algorithm/Code for “insertion sort”. Trace your algorithm on following data- “ 10,20,30” [3+1]
- (c) Show the output of quick sort algorithm, after each pass on following data: - “ 30, 50 ,10 , 20 [4]
60,40 , 90, 80”. Note:-clearly show the partitions formed in each pass.
- OR
- Q.3 (a) Write the merge sort algorithm/Code, using iterative approach. Trace your algorithm/Code on [6+3]
the following data: “60, 30, 10, 40, 20, 70, 10, and 50”.
Note-clearly show all passes
- (b) Sort the words-COW, DOG, SEA, RUG, MOB, BOX-alphabetically using radix sort. Give [3]
final sorted output generated. Note:- show the results of all passes.