

Total No. of Questions—8]

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**[5252]-162**

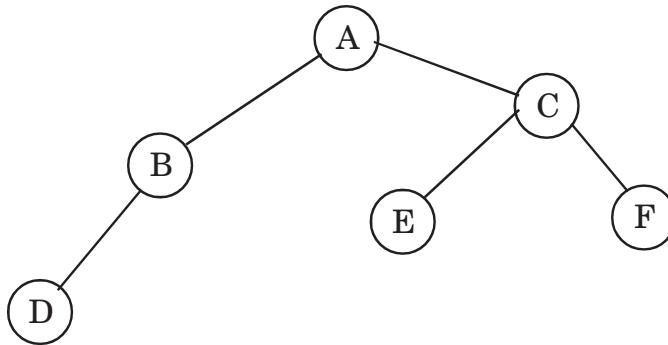
**S.E. (Computer Engineering) (First Semester)  
EXAMINATION, 2017  
DATA STRUCTURES AND PROBLEM SOLVING  
(2012 PATTERN)**

**Time : Two Hours**

**Maximum Marks : 50**

- N.B. :-** (i) Answer Q. 1 or Q. 2, Q. 3 or Q. 4, Q. 5 or Q. 6, Q. 7 or Q. 8.  
(ii) Neat diagrams must be drawn whenever necessary.  
(iii) Figures to the right indicate full marks.  
(iv) Use of calculator is allowed.  
(v) Assume suitable data, if necessary.

1. (a) Represent the following binary tree using arrays : [4]



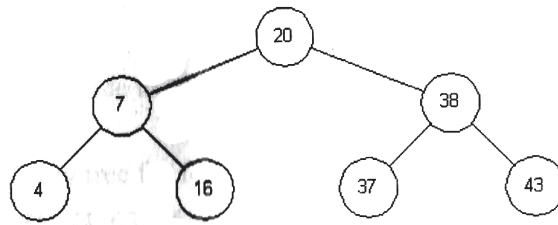
- (b) Write the frequency count for the following code : [4]
- ```
for(i=0;i<n;i++)  
{  
  for(j=0;j<n;j++)  
  {  
    c[i][j]=a[i][j]+b[i][j];  
  }  
}
```

P.T.O.

- (c) Sort the following data using quick sort in ascending order :  
 50, 30, 10, 90, 80, 20, 40, 70 [4]

Or

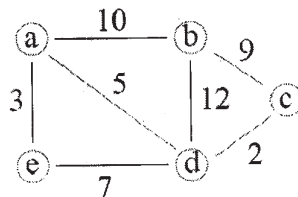
2. (a) What is Binary Search Tree ? Write inorder, preorder and postorder traversal of the following tree : [4]



- (b) Explain various Asymptotic notations. [3]  
 (c) Explain the terms inorder successor and inorder predecessor with respect to threaded binary tree. [2]  
 (d) Sort the following elements using radix sort in ascending order. Show all the steps.

35, 40, 7, 5, 50, 120, 99 [3]

3. (a) What is Hashing ? Explain hashing methods with example. [4]  
 (b) Explain topological sorting with example. [4]  
 (c) Find Minimum Spanning Tree for the following graph using Kruskal's algorithm. [4]



*Or*

4. (a) Insert the following data in the hash table of size 10 using linear probing with chaining without replacement : [6]  
131, 3, 4, 21, 61, 6, 71, 8, 9
- (b) Explain various Graph storage structures. [6]
5. (a) Write algorithm to search an element in B tree. [6]
- (b) Sort the following data in ascending order using heap sort : [4]  
15, 10, 40, 25
- (c) List and explain any *three* operations carried out on sequential file. [3]

*Or*

6. (a) Write a pseudo C/C++ code to sort data using heap sort. [6]
- (b) Construct 5-way binary tree for the following data : [7]  
78, 21, 14, 11, 97, 85, 74, 63, 45, 42, 57, 20, 16, 19
7. (a) Write a parallel algorithm for odd-even merge sort. [7]
- (b) Explain pointer doubling problem with example. [6]

*Or*

8. (a) Explain prefix computation problem with example. [6]
- (b) Write a parallel algorithm to perform addition of given numbers using complete binary tree method. [7]