Bachelor of Science (B.Sc.) (Part-II) Fourth Semester

B.Sc. 24141 - Computer Science Paper – I (Data Structures)

P. Pages : 2 **GUG/W/18/1286**

Time : Three Hours * 0 9 9 * Max. Marks : 50

Notes : 1. All questions are compulsory & carry equal marks.
2. Draw neat and labelled diagrams wherever necessary.
3. Assume suitable data wherever necessary.
4. Avoid to write vague answers.

1. Either :

a) Describe operations on Data Structures. **5**

b) Write an algorithm to calculate sum of all even values in array of size 'n'. **5**

OR

c) Explain binary search method. Give limitations of the Binary search algorithm. **5**

d) Write an algorithm to sort the elements using Bubble Sort Method. **5**

2. Either :

a) What is Priority Queue? Explain with suitable example. **5**

b) Write an algorithm to PUSH an element into stack. **5**

OR

c) What is circular queue? Explain with suitable example. **5**

d) Write an algorithm to insert an element into queue. **5**

3. Either :

a) Differentiate between Recursive and Iterative function with suitable example. **5**

b) Write an algorithm for Fibonacci series using Recursion. **5**

OR

c) Write a note on Garbage Collection. **5**

d) Explain overflow and underflow condition with respect to linked list. **5**

4. Either :

a) A binary tree T has 9 nodes. The inorder and preorder traversals of T yield the following sequences of nodes : **5**

Inorder : E A C K F H D B G

Preorder : F A E K C D H G B

Draw the binary tree T. Also explain the logic.

b) Write an algorithm to traverse a Tree by using Inorder Traversal method. **5**

OR

c) Write an algorithm to demonstrate PRIM's Algorithm. **5**

d) Discuss various terminology used in Graph. **5**

5. All questions are compulsory.

a) What is array? Give example. **2½**

b) Convert infix expression into postfix expression $b^2 2 - 4 * a * c$. **2½**

c) Write recursive algorithm to find factorial of a given number. **2½**

d) Write a note on indegree and outdegree of Graph. **2½**

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