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Seat No.	
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[4968]-3002

B.C.A. (Semester-III) EXAMINATION, 2016
302 : DATA STRUCTURE USING C++
(2013 PATTERN)

Time : 3 Hours

Maximum Marks : 80

- N.B. :—** (i) All questions are compulsory.
(ii) All questions carry equal marks.
(iii) Assume suitable data, if necessary.

1. Attempt any *eight* of the following : [8×2=16]
- (a) What is Data Structure ?
 - (b) What is Ancestor of Node ?
 - (c) What are the operations we can perform on to the queue?
 - (d) Differentiate between array and structure.
 - (e) What is Big-O notation ?
 - (f) When multiplication of two polynomials is possible ?
 - (g) What is strongly connected graph ?
 - (h) Give the formulae for address calculation for row and column major representation ?
 - (i) How to measure performance of an algorithm ?
 - (j) What is indegree and outdegree of node in a graph ?
2. Attempt any *four* of the following : [4×4=16]
- (a) Explain BFS traversing technique with an example.
 - (b) Explain Heap Sort technique with an example.
 - (c) Write a function to sort given singly linked list.
 - (d) Write a function to reverse a given string by using stack.
 - (e) Write a program for addition of two polynomials.

P.T.O.

3. Attempt any *four* of the following : [4×4=16]
- (a) Write a function to traverse a graph by using DFS.
 - (b) Explain Height balance tree with an example.
 - (c) Explain graph representation techniques with an example.
 - (d) Sort the following data by using selection sort technique :
56, 23, 2, 78, 122, 89, 43, 1
 - (e) Write a function to reverse singly linked list.
4. Attempt any *four* of the following : [4×4=16]
- (a) Explain Prim's algorithm for minimal spanning tree.
 - (b) Write a function to calculate average of elements of nodes in singly linked list.
(e.g. (value of first Node + value of second node +.....)/ Number of nodes)
 - (c) Write a function to create and display circular singly linked list.
 - (d) Explain different types of recursive tree traversing technique with an example.
 - (e) What is an algorithm ? Explain its characteristics in detail.
5. Attempt any *four* of the following : [4×4=16]
- (a) Write function to remove last node of singly linked list and add it at the beginning of list.
 - (b) Write a function to create doubly linked list and display it.
 - (c) Explain Quick Sort with an example.
 - (d) Write an algorithm for evaluation of postfix expression.
 - (e) What is circular queue ? Explain it with an example.