

S.Y. B. SC. (Computer Science) SEM –IV (CBCS - 2016 COURSE) :
WINTER - 2018

SUBJECT: DATA STRUCTURES USING C++

Day: Tuesday
Date: 09/10/2018

W-2018-0920

Time: 03.00 PM TO 06.00 PM
Max. Marks: 60

N.B:

- 1) All questions are **COMPULSORY**.
 - 2) Figures to the right indicate **FULL** marks.
 - 3) Draw neat and labeled diagram **WHEREVER** necessary.
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Q.1 Answer **ANY TWO** of the following: [12]

- a) Explain bubble sort algorithm with following data:
24 58 47 37 12 92 86 23
- b) Define Queue. Also write `addq()` and `deleteq()` functions in C++ to perform insertion and deletion operations.
- c) Elaborate binary search algorithm with suitable example.

Q.2 Answer **ANY TWO** of the following: [12]

- a) Illustrate selection sort with example.
- b) Write C++ program to create and display singly linked list.
- c) Explain BFS and DFS with examples.

Q.3 Answer **ANY TWO** of the following: [12]

- a) Convert the given infix expression to prefix and post fix notation:
i) $(A + B) * (C + D)$ ii) $((a + b) * c) - d$
- b) Illustrate different types of graph.
- c) Explain shortest path problem with example.

Q.4 Attempt **ANY THREE** of the following: [12]

- a) What is Big O notation? Explain space complexity and time complexity.
- b) Differentiate between array and stack.
- c) Write note on AVL tree.
- d) Elaborate different operations performed on doubly linked list.

Q.5 Answer **ANY FOUR** of the following: [12]

- a) Differentiate between linear queue and circular queue.
- b) Explain shell sort with example.
- c) Explain binary tree with example.
- d) Explain Abstract data type.
- e) Elaborate operation on a stack.
- f) Write note on topological sort.

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