

**BCA-12**  
December - Examination 2016  
**BCA Pt. II Examination**  
**Data Structure and Algorithm**  
**Paper - BCA-12**

**Time : 3 Hours ]**

**[ Max. Marks :- 100**

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**Note:** The question paper is divided into three sections A, B and C. Write answers as per given instructions.

**Section - A**

**10 × 2 = 20**

(Very Short Answer Questions)

**Note:** Answer **all** questions. As per the nature of the question delimit your answer in one word, one sentence or maximum upto 30 words. Each question carries 2 marks.

- 1) (i) What do you understand by data structure?
- (ii) Define circular queue.
- (iii) What is a stack? Write about some real life applications of stack.
- (iv) What are the various operations of queue?
- (v) Define tree.
- (vi) Write applications of graph in brief.
- (vii) What are the advantages and disadvantages of quicksort?

- (viii) What is the concept of Dynamic Programming?
- (ix) What do you understand by complexity of algorithm?
- (x) What are binary search trees?

**Section - B****4 × 10 = 40**

(Short Answer Questions)

**Note:** Answer **any four** questions. Each answer should not exceed 200 words. Each question carries 10 marks.

- 2) Differentiate the sequential search and binary search on the basis of complexity.
- 3) Explain the concept of asymptotic notations and why we use it.
- 4) Compare Dynamic Programming with greedy and divide and conquer methods.
- 5) Briefly describe the basic idea of quicksort.
- 6) Explain the binary search technique with a suitable example.
- 7) Write the properties of BST? How it is useful for searching a node in the tree?
- 8) Discuss the following terms with reference to stack:
  - TOP
  - PUSH
  - POP
- 9) Compare linked list and array on the basis of operations on both data structure.

**Section - C****2 × 20 = 40**

(Long Answer Questions)

**Note:** Answer **any two** questions. You have to delimit your each answer maximum upto 500 words. Each question carries 20 marks.

- 10) Write an algorithm for traversing a BST inorder, preorder and postorder form.
- 11) Write an algorithm to traversal graph in Depth First Search Manner.
- 12) Write a recursive function to find the search a number using binary search.
- 13) Given the following array:  
40, 55, 20, 30, 50, 15, 25

Show the contents of array after each sort listed below:

- (i) Insertion sort (after 4th iteration)
  - (ii) Bubble sort (after 3rd iteration)
  - (iii) Selection sort (after 4th iteration)
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