

## BCA 4th Semester Exam, 2015

## FILE AND DATA STRUCTURE

Time : 3 hours

Full Marks : 100

Instructions :

- (i) The marks are indicated in the right-hand margin.
- (ii) There are **SEVEN** questions in this paper.
- (iii) Attempt **FIVE** questions in all.
- (iv) Question Nos. 1 and 2 is compulsory.

1. Choose the correct option/Answer/Fill in the blanks (any six) : 2×6=12

(a) The frequency count of the statement "for  $K = 3$  to  $(m+2)$  do" is

- (i)  $(m+2)$
- (ii)  $(m-1)$
- (iii)  $(m+1)$
- (iv)  $(m+5)$

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(b) For the array  $A$  with  $\alpha = 220$  as the base address, find the address of the element specified in  $A[-2 : 4, -6 : 10]$ .

(c) The complexity of binary search algorithm is \_\_\_\_\_.

(d) Linear search is performed on a sorted array.

(i) True

(ii) False

(e) What is the postfix equivalents of the given infix expression?

$$A * B + C / D$$

(f) Find out the infix equivalents of the given postfix equivalents :

$$ABC * + D -$$

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(g) Reverse polish notation is the other name of \_\_\_\_\_.

(h) Degree of a leaf node is \_\_\_\_\_.

(i) The depth of root node is \_\_\_\_\_.

(j) A binary tree of height  $h$  has at least  $h$  nodes and at most \_\_\_\_\_ nodes.

2. Answer any three of the following questions :

4×3=12

(a) Compare among best case, average case and worst case complexities with example.

(b) How to analyze recursive programs? Explain with an example.

(c) Give the advantages and uses of a circular linked list.

(d) How does linked stack differ from linear array?

(e) Explain preorder, postorder and inorder traversals of a tree with an example.

3. What do you mean by complete binary tree and extended binary tree? Construct a binary tree from the given inorder and preorder traversals : 12

Inorder : E A C K F H D B G

Preorder : F A E K C D H G B

4. Define  $m$ -way search tree. How do insertion and deletion operations performed in an  $m$ -way search tree? 12

5. Explain heapsort with an example. Also discuss its complexity. 12

6. Discuss the sequential representation of graphs. 12

7. Explain linear search and binary search with example. Also discuss its time complexity. 12