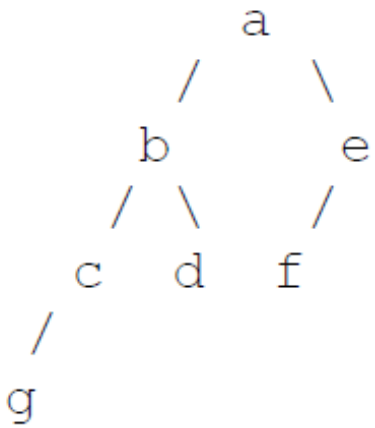
Tutorial-1

1. Let A and B be sets and let A^c and B^c denote the complements of the sets A and B. The set $(A-B) \cup (B-A) \cup (A \cap B)$ is equal to

   A) **$A \cup B$** B) $A^c \cup B^c$ C) $A \cap B$ D) $A^c \cap B^c$

2. Which of the following sequences denotes the post order traversal sequence of the given tree?



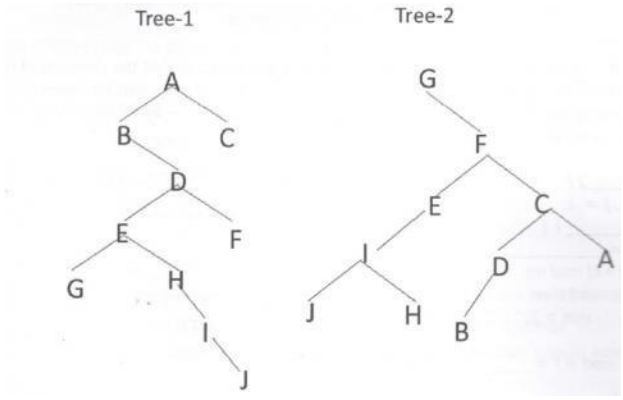
   A) f e g c d b a (B) g c b d a f e **(C) g c d b f e a** (D) f e d g c b a

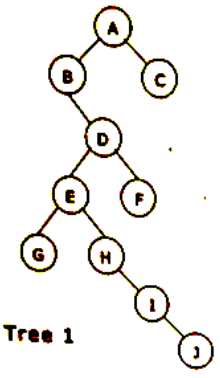
3. Assume that the operators +, −, × are left associative and ^ is right associative. The order of precedence (from highest to lowest) is ^, ×, +, −. The postfix expression corresponding to the infix expression is a + b × c – d ^ e ^ f

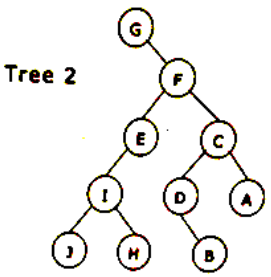
   (A) abc x + def ^ ^ – (B) abc x + de ^ f ^ –

   (C) ab + c × d − e^f^ (D) − + a × b c^^ def

4. If Tree-1 and Tree-2 are the trees indicated below:





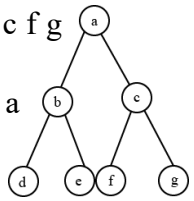


   Which traversals of Tree-1 and Tree-2, respectively, will produce the same sequence?

   (A) Preorder, postorder **(B) Postorder, inorder**

   (C) Postorder, preorder (D) Inorder, preorder

5. The in-order and pre-order traversal of a binary tree are d b e a f c g and a b d e c f g respectively. The post order traversal of a binary tree is

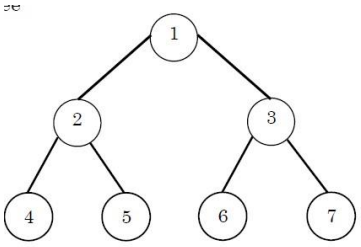


(A) e d b g f c a (B) e d b f g c a **(C) d e b f g c a** (D) d e f g b c a

6. The in-order traversal of a tree resulted in FBGADCE. Then the pre-order traversal of that tree would result in

(A) FGBDECA **(B) ABFGCDE** (C) BFGCDEA (D) AFGBDEC

7. Consider the following tree



Post Order 4 5 2 6 7 3 1

If the post order traversal gives ab-cd*+ then the label of the nodes 1,2,3,… will be

(A) **+,-,*,a,b,c,d** (B) a,-,b,+,c,*,d (C) a,b,c,d,-,*,+ (D) -,a,b,+,*,c,d

8. Choose the equivalent prefix form of the following expression (a + (b − c))* ((d − e)/(f + g − h))

(A) *** +a − bc /− de − +fgh** (B) * +a −bc − /de − +fgh
(C) * +a − bc /− ed + −fgh (D) * +ab − c /− ed + −fgh

9. The inorder and preorder Traversal of binary Tree are dbeafcg and abdecfg respectively. The post-order Traversal is _____.

(A) dbefacg (B) debfagc (C) dbefcga **(D) debfgca**

10. The following three are known to be the preorder, inorder and postorder sequences of a binary tree. But it is not known which is which.

MBCAFHPYK
KAMCBYPFH
MABCKYFPH

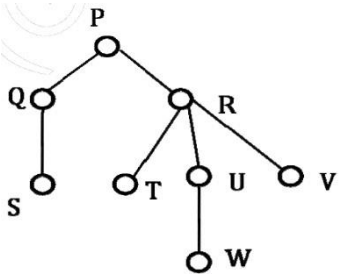
Pick the true statement from the following.

(A) I and II are preorder and inorder sequences, respectively
(B) I and III are preorder and postorder sequences, respectively
(C) II is the inorder sequence, but nothing more can be said about the other two sequences
(D) **II and III are the preorder and inorder sequences, respectively**

11. Which of the following statement is false?
    (A) A tree with n nodes has (n-1) edges.
    (B) **A labeled rooted binary tree can be uniquely constructed given its postorder and preorder traversal results.**
    (C) A complete binary tree with n internal nodes has (n+1) leaves.
    (D) The maximum number of nodes in a binary tree of height h is (2^(h+1) -1).

12. Which of the following pairs of traversals is not sufficient to build a binary tree from the given traversals?
    (A) Preorder and Inorder
    (B) **Preorder and Postorder**
    (C) Inorder and Postorder
    (D) None of the Above

13. Consider the following rooted tree with the vertex P labeled as root

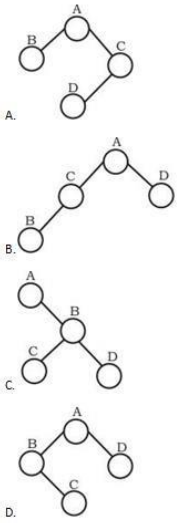


Since this is not a binary tree, in-order is not well-defined. If we define in-order traversal for this case as
- Visit left-most child
- Visit root
- Visit remaining children

Then in-order traversal will be **SQPTRWUV**

The order in which the nodes are visited during in-order traversal is (A) **SQPTRWUV**
(B) SQPTURWV (C) SQPTWUVR (D) SQPTRUWV

14. Which one of the following binary trees has its inorder and preorder traversals as BCAD and ABCD, respectively?



(A) A (B) B (C) C **(D) D**

15. Consider the label sequences obtained by the following pairs of traversals on a labeled binary tree. Which of these pairs identify a tree uniquely?

(i) preorder and postorder
(ii) inorder and postorder
(iii) preorder and inorder
(iv) level order and postorder

(A) (i) only **(B) (ii), (iii)** (C) (iii) only (D) (iv) only

16. What is common in three different types of traversals (Inorder, Preorder and Postorder)?

(A) Root is visited before right subtree
(B) **Left subtree is always visited before right subtree**
(C) Root is visited after left subtree
(D) All of the above
(E) None of the above