

**BACHELOR OF COMPUTER APPLICATIONS  
(BCA) (Pre-Revised)****Term-End Examination****December, 2015****CS-62 : 'C' PROGRAMMING AND DATA  
STRUCTURES***Time : 2 hours**Maximum Marks : 60*

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**Note :** *Question number 1 is compulsory. Answer any three questions from the rest. All algorithms should be written nearer to 'C' language.*

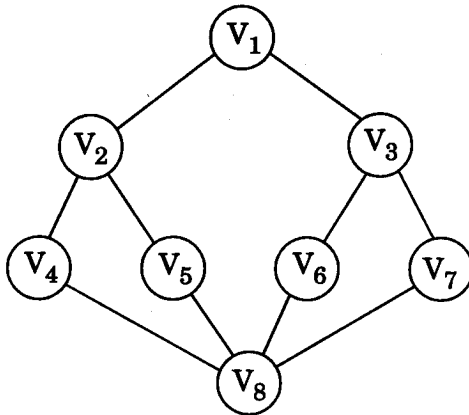
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1. (a) Write an algorithm to generate the first 10 Fibonacci numbers. 6
- (b) Evaluate the following postfix expression using stack :  
 $8\ 4\ 5\ +\ * \ 6\ / \ 3\ +$   
Show every step of the evaluation process. 3
- (c) Write the postfix form of the expression :  
 $A * B + C / D$  2

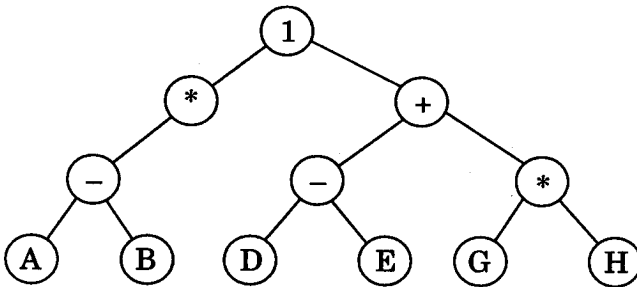
- (d) Apply BFS to the following graph and list the vertices in the order they would be visited :

6



- (e) Traverse the tree as given below in preorder, inorder and postorder and list the vertices in the order they would be visited in each traversal scheme :

6



- (f) Apply 2-way merge sort to the following data :

5

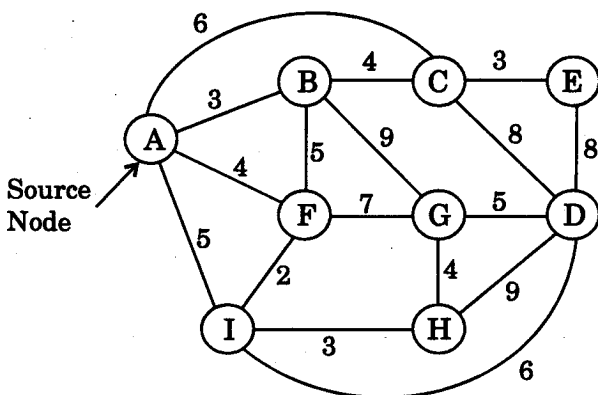
7 12 14 5 9 8 6 3

- (g) Give an example of a ternary operator in C-language.

2

2. (a) Apply a single source (Node A) shortest path algorithm to the following weighted graph :

7



- (b) Show how an array A [3][3] is stored in column major order.

3

3. (a) Let P be the pointer to the first node in a singly linked list and X be an arbitrary node in this list. Write an algorithm to delete this node from the list.

6

- (b) Explain the meaning of the following statements in C-language :

4×1=4

- (i)  $P_x = \&x$
- (ii)  $y = *P_x$
- (iii)  $y = *P_x + 1$
- (iv)  $y = *(P_x + 1)$

4. (a) What is a heap ? Perform bottom-up construction of a heap for the list :

7

3 9 7 4 5 8

- (b) Explain the following terms : 3×1=3
- (i) Seek time
  - (ii) Latency time
  - (iii) Transfer time
5. (a) What is a binary search tree ? Show the result of inserting 3, 1, 4, 6, 9, 2, 5, 7 into an initially empty binary search tree. 6
- (b) Answer the following questions :
- (i) What are the differences between a graph and a tree ? 2
  - (ii) Write the syntax and meaning of dynamic memory allocation functions in C-language. 2
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