Question Paper Code : 52369

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2017

Third Semester

Computer Science and Engineering

CS2201 : DATA STRUCTURES

(Regulations 2008)

[Common to : PTCS2201 – Data Structures for B.E. (Part-Time) Third Semester – CSE – Regulations 2009]

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A (10×2=20 Marks)

1. What is abstract data type ?

2. Convert the infix expression to the postfix expression "a + b * c + (d * e + f) *g".

3. For the tree in Figure 3.
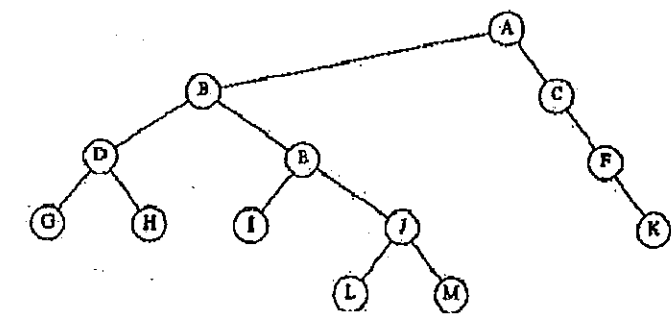   a) List the siblings for node B.
   b) Compute the height.

Figure 3

4. Show the result of inserting 3, 1, 4, 6, 9, 2, 5, 7 into an initially empty binary search tree.

5. What are the rotations in splay tree ?

6. What are the structural properties of B tree ?

7. What is the function of path compression ?

8. What is equivalence relations ? Does electrical connectivity is an equivalence relations ?

9. Define Euler circuits.

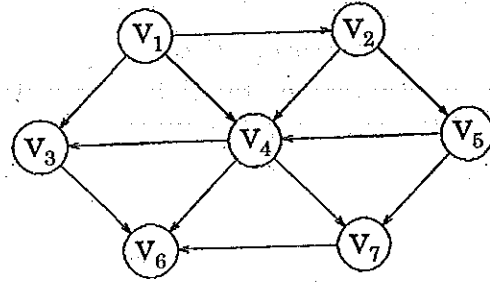10. What is the result of applying topological sort to Figure 10 ?

Figure 10

PART – B   (5×16=80 Marks)

11. a) What is stack ? State the basic operation on a stack. Explain the array implementation of stack with suitable example.

(OR)

b) Swap two adjacent elements by adjusting only the pointers (and not the data) using
   i) Singly linked lists,
   ii) Doubly linked lists.

12. a) Write the following routines to implement the basic binary search tree operations.
   i) Make an empty tree.
   ii) Find operation for binary search tree.
   iii) Find min. and Find max.
   iv) Insertion into binary search tree.

(OR)

b) What are expression Trees ? Write the procedure for constructing an expression tree.

13. a) Give the algorithm for insert routine and show the result of inserting 2, 1, 4, 5, 9, 3, 6, 7 into an initially empty AVL tree.

(OR)

b) What are binary heap ? State and explain the heap operations.

14. a) Given input {4371, 1323, 6173, 4199, 4344, 9679, 1989} and a hash function $h(x) = x(\bmod 10)$, show the resulting
   a) open hash table
   b) closed hash table using linear probing
   c) closed hash table using quadratic probing
   d) closed.

(OR)

b) What is dynamic equivalence problem ? State and explain the permissible operation on disjoint set.

15. a) State and explain the breadth first traversal with example. State the application of depth first search.

(OR)

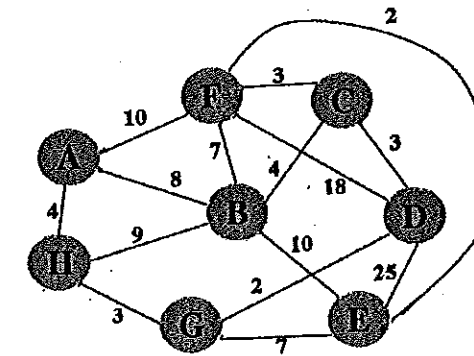b) State and explain the prim's algorithm with the graph given in Figure 15 (b).

Figure 15 (b)