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Question Paper Code : 25060

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

Third Semester

Computer Science and Engineering

CS 8391 – DATA STRUCTURES

(Common to Information Technology / Computer and Communication Engineering)

(Regulations 2017)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State the advantage of ADT.

2. What are the disadvantage of linked list over array?

3. What are the application of stacks?

4. What are priority queues? What are the ways to implement priority queue?

5. For the tree in Figure 1.

   (a) List the siblings for node E.
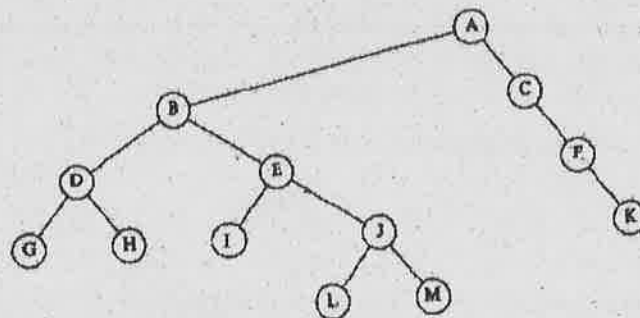
   (b) Compute the height.

Figure 1

6. Show the result of in order traversal of the binary search tree given in Figure 2.
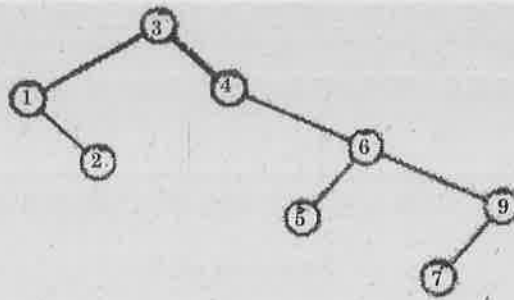

Figure 2

7. What are the representation of the graphs?

8. Define Euler circuits.

9. What are the advantage and disadvantage of separate chaining and linear probing?

10. State the complexity of binary search.

PART B — (5 × 13 = 65 marks)

11. (a) (i) State the polynomial representation for $6x^3 + 9x^2 + 7x + 1$ using linked list. Write procedure to add and multiply two polynomial and explain with suitable example. (7)

    (ii) What are the ways to insert a node in linked list? Write an algorithm for inserting a node before a given node in a linked list. (6)

Or

    (b) (i) What are the various operations on array? Write a procedure to insert an element in the middle of the array. (7)

    (ii) Write a procedure to deleting the last node from a circular linked list. (6)

12. (a) Write the procedure to convert the infix expression to postfix expression and steps involved in evaluating the postfix expression. Convert the expression $A - (B / C + (D \% E^* F) / G)^* H$ to postfix form. Evaluate the given postfix expression 9 3 4 * 8 + 4 / −.

Or

    (b) What are circular queues. Write the procedure to insert an element to circular queue and delete an element from a circular queue using array implementation.

13. (a) Write the following routines to implement the basic binary search tree operations.

   (i) Perform search operation in binary Search Tree.

   (ii) Find_min and Find_max.

   Or

   (b) Distinguish between B Tree and B+ tree. Create a B tree of order 5 by inserting the following elements: 3, 14, 7, 1, 8, 5, 11, 17, 13, 6, 23, 12, 20, 26, 4, 16, 18, 24, 25, and 19.

14. (a) Distinguish between breadth first search and depth first search with example.

   Or

   (b) State and explain topological sort with suitable example.

15. (a) (i) State and explain the shell sort. State and explain the algorithm for shell sort. Sort the elements using shell sort. (7)

   (ii) Explain Open Addressing in detail. (6)

   Or

   (b) (i) Distinguish between linear search and binary search. State and explain the algorithms for both the search with example. (7)

   (ii) Explain Rehashing and extendible hashing. (6)

PART C — (1 × 15 = 15 marks)

16. (a) What are expression Trees. Write the procedure for constructing an expression Tree.

   Or

   (b) Given input {4371, 1323, 6173, 4199, 4344, 9679, 1989} and a hash function $h(x) = x \pmod{10}$, show the resulting

   (i) open hash table

   (ii) closed hash table using linear probing

   (iii) closed hash table using quadratic probing

   (iv) closed.