Reg. No. :

Question Paper Code: 43202

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2018

Third Semester

Computer Science and Engineering

14UCS302-DATA STRUCTURES

(Regulation 2014)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Which of the following data structure is linear data structure?

    (a) trees   (b) graphs   (c) arrays   (d)none of above

2. A queue is a

    (a) FIFO   (b) LIFO   (c) FILO   (d) LOFI

3. The post order traversal of a binary tree is DEBFCA. Find out the pre order traversal

    (a) ABFCDE   (b) ADBFEC   (c) ABDECF   (d) ABDCEF

4. A Binary Search Tree is traversed in the following order recursively: Right, root, left The output sequence will be in

    (a) ascending order   (b) descending order
    (c) bitomic sequence   (d) no specific order

5. Leaves of which of the following trees are at the same level?

    (a) Binary Tree   (b) B-tree
    (c) AVL-tree   (d)Expression tree

6. B trees are generally_____

    (a) no specific structure   (b) very deep and very wide

    (c) very wide and shallow   (d) very deep and narrow

7. If h is any hashing function and is used to hash n keys in to a table of size m, where n<=m, the expected number of collisions involving a particular key x is

    (a) less than 1   (b) less than n   (c) less than m   (d) less than n/2

8. Rehashing can be used in

    (a) Linear probing   (b) Quadratic probing

    (c) Separate chaining   (d) All of the above

9. In a graph if e = [u,v], then u & v are called

    (a) end point of e   (b) adjacent nodes

    (c) neighbors   (d) all the above

10. In a graph if e=[u, v], Then u and v are called

    (a) endpoints of e   (b) adjacent nodes   (c) neighbors   (d) all the above

PART - B (5 x 2 = 10 Marks)

11. Mention the advantages of representing stacks using linked lists than arrays.

12. What is the use of threaded binary tree?

13. List out the two properties of heap.

14. List the collision resolution methods in Hashing.

15. Define connected components of a graph .write its uses.

PART - C (5 x 16 = 80 Marks)

16. (a) (i) Infer the insertion and deletion operation in doubly linked list.   (8)

       (ii) Explain Push and Pop operations on stack for the given instructions, Push 10, 20, 30, 40 and Pop once. Display the result and write the routine for each operation.   (8)

Or

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(b) Infer Queue. How is Circular Queue implemented? Give example. (16)

17. (a) Write the pseudo code for the tree traversal and explain it with an example. (16)

Or

(b) Show a routine to insert an element into an BST tree and display the result of inserting the following keys 3, 1, 4, 5, 9, 2, 6, 8, 7, 10. (16)

18. (a) Develop an algorithm to implement binary heap and validate with an example. (16)

Or

(b) (i) Write a program that performs the following operations in a binary heap: (1) Insert (2) DeleteMin (3) Build Heap and (4) FindMin. (8)

(ii) Explain the various rotations in splaying strategy. Also explain insertion and deletion in a splay tree with example. (8)

19. (a) Express Smart Union algorithms in detail. (16)

Or

(b) Illustrate the collision resolution strategies with an example. (16)

20. (a) Identify the necessity for graph traversal. Perform the Depth first and Breadth first traversals, print the list of nodes in the order it is visited and compare these algorithms. (16)

Or

(b) (i) Define graph traversal and perform the Breadth First Traversals for the given graph. (8)

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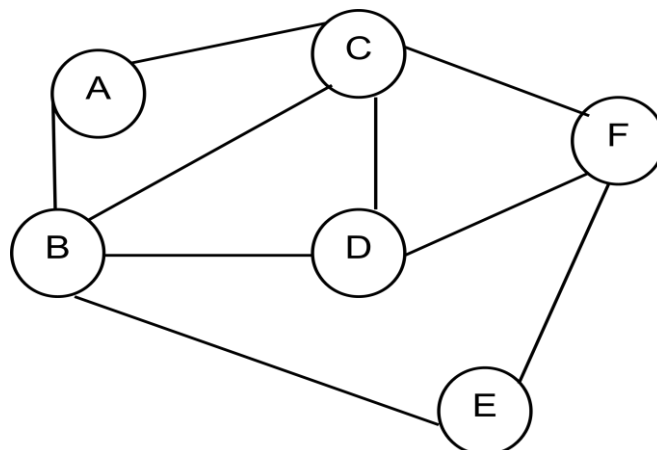
(ii) Identify the Minimum Spanning Tree for the following graph using Prim's algorithm. (8)