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Question Paper Code: U2C05

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2022

Second Semester

Computer Science and Business Systems

21UCB205- Algorithms And Data Structures

(Regulations 2019)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Which of the following is linear asymptotic notations CO3- Ana
(a) $O(1)$ (b) $O(\log n)$ (c) $O(n)$ (d) $O(n \log n)$
2. An algorithm should have _____ well-defined outputs CO1- U
(a) 0 (b) 1 (c) 0 or more (d) 1 or more
3. Linked list is considered as an example of _____ type of memory CO1- R
allocation.
(a) Dynamic (b) Static (c) Compile time (d) Heap
4. If the elements "A", "B", "C" and "D" are placed in a queue and are CO3- Ana
deleted one at a time, in what order will they be removed?
(a) ABCD (b) DCBA (c) DCAB (d) ABDC
5. Floyd Warshall Algorithm can be used for finding _____ CO1- R
(a) Single source shortest path (b) Topological sort
(c) Minimum spanning tree (d) Transitive closure
6. The leaves of an expression tree always contain? CO1- R
(a) operators (b) operands (c) null (d) expression
7. Which of the following is not the algorithm to find the minimum CO1- R
spanning tree of the given graph?
(a) Boruvka's algorithm (b) Prim's algorithm
(c) Kruskal's algorithm (d) Bellman-Ford algorithm

8. The Breadth First Search traversal of a graph will result into? CO1- U
 (a) Linked List (b) Tree (c) Graph with back edges (d) Arrays
9. What is the best case complexity of selection sort? CO1- U
 (a) $O(n \log n)$ (b) $O(\log n)$ (c) $O(n)$ (d) $O(n^2)$
10. Which of the following sorting algorithms is the fastest for sorting small arrays? CO3- Ana
 (a) Quick sort (b) Insertion sort (c) Shell sort (d) Heap sort

PART – B (5 x 2= 10 Marks)

11. Define Big Omega Notations. CO1- U
12. List the applications of Stack. CO1- U
13. What is complete Binary Tree? CO1- U
14. Compare DFS and BFS CO3- Ana
15. List Collision Resolution Technique. CO1- U

PART – C (5 x 16= 80 Marks)

16. (a) Explain in detail about Asymptotic Notations. CO2- App (16)
 Or
 (b) Explain Recursion with an Example and how would you analyze performance of an Algorithm. CO2- App (16)
17. (a) Develop a C program to implement the following operations in Singly Linked List. CO2- App (16)
 (i) Insert at the End
 (ii) Insert at the beginning
 (iii) Insert middle
 Or
 (b) Develop a C program to implement the following operations in Stack with an example. CO2- App (16)
 (i) Push
 (ii) pop
18. (a) Construct a Binary Search tree for the following data 10, 5, 15, 3, 4, 19, 18, 20, 1,7 and perform deletion of data 1, 15, 10 orderly. CO2- App (16)

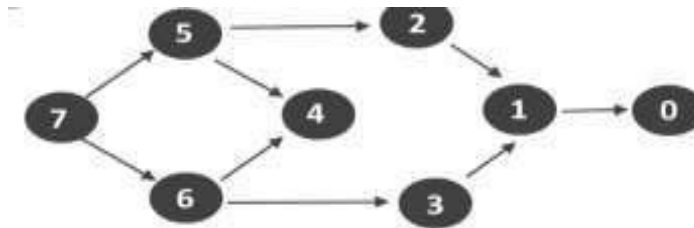
Or

(b) Construct AVL Tree for the following data CO4- Ana (16)
3,2,1,4,5,6,7,16,15,14 with neat sketch.

19. (a) Explain the concept of Breadth First Search and Depth First Search with an Example. CO2- App (16)

Or

(b) Find topological ordering for the given graph. CO2- App (16)



20. (a) Develop a C Program to Perform Linear and Binary Search CO2- App (16)
with an appropriate Example

Or

(b) Develop a C Program to Perform Bubble sort for the following CO2- App (16)
data 20 , 30 , 40 ,50 ,10

