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| **P.V.P Siddhartha Institute of Technology(Autonomous)** | | | | | | | | | | | | | | | | | | | | | | | | | **Signature of Invigilator with date:** | | **Marks Obtained:** | |
| **Department of Computer Science and Engineering** | | | | | | | | | | | | | | | | | | | | | | | | |
| **Course: B. Tech** | | | | | | | **Year: II** | | **Semester -II** | | | | | | | **Objective-II** | | | | | | | | |  | |  | |
| **Regulation:PVP20** | | | | | | | **Maximum Marks: 10M** | | | | | | | | | **Session: F.N** | | | | | | | | |
| **A.Y:2023-24** | | | | | | | **Date:25-04-24** | | | | | | | | | **Duration: 20 min** | | | | | | | | |
| **Subject Code:20CS3402** | | | | | | | **Subject Name: Advanced Data Structures** | | | | | | | | | | | | | | | | | | | | | |
| **Registered Number:** | | | | | | | | | | | | | | | | **Name:** | | | | | | | | | | | | |
| **Answer all the Questions. Each Question carries ½ Mark 20×½ M=10M** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **S.No** | **Question** | | | | | | | | | | | | | | | | | | | | | | | | | **CO** | **Level** | **Answer** |
| 1 | A B-tree of order M is an M-ary tree with the following properties: | | | | | | | | | | | | | | | | | | | | | | | | | **CO1** | **L2** |  |
| a. The data items are stored at leaves. | | | | | b. The root is either a leaf or has between two and M children. | | | | | | | | c. All nonleaf nodes (except the root) have between M/2 and M children. | | | | | | | | | d. All the above | | |
| 2 | A \_\_\_ operation return any specific name, just that finds on two elements return the same answer if and only if they are in the same set. | | | | | | | | | | | | | | | | | | | | | | | | | **CO1** | **L2** |  |
| a) Find | | | | | | | | b) bunion | | | | | | | | | | | | | | | | |
| c) disjoint | | | | | | | | d) Union by size | | | | | | | | | | | | | | | | |
| 3 | How many properties will an equivalent relationship satisfy? | | | | | | | | | | | | | | | | | | | | | | | | | **CO1** | **L2** |  |
| a) 1 | | | | | | | | | | | | | b) 2 | | | | | | | | | | | |
| c) 3 | | | | | | | | | | | | | d) 4 | | | | | | | | | | | |
| 4. | A relation R on a set S, defined as x R y if and only if y R x. This is an example of? | | | | | | | | | | | | | | | | | | | | | | | | | **CO1** | **L2** |  |
| a) reflexive relation | | | | | | | | b) symmetric relation | | | | | | | | | | | | | | | | |
| c) transitive relation | | | | | | | | d) invalid relation | | | | | | | | | | | | | | | | |
| 5. | Electrical connectivity is an example of equivalence relation. | | | | | | | | | | | | | | | | | | | | | | | | | **CO1** | **L2** |  |
| a) True | | | b)False | | | | | | | | | | | | | | | | | | | | | |
| 6. | What is the worst case efficiency for a path compression algorithm? | | | | | | | | | | | | | | | | | | | | | | | | | **CO1** | **L2** |  |
| a) O(N) | | | b) O(log N) | | | | | c) O(N log N) | | | | | | | | | | | d) O(M log N) | | | | | |
| 7. | What is the depth of any tree if the union operation is performed by height? | | | | | | | | | | | | | | | | | | | | | | | | | **CO1** | **L2** |  |
| a) O(N) | | | | | b) O(log N) | | | | | | | | c) O(N log N) | | | | | | | | | d) O(M log N) | | |
| 8. | A topological sort is an ordering of vertices in a directed acyclic graph, such that if there is a path from vi to vj, then vj appears after vi in the ordering. | | | | | | | | | | | | | | | | | | | | | | | | | **CO1** | **L2** |  |
| 1. True | | | | | | | | | | | | | 1. False | | | | | | | | | | | |
| 9. | How many topological orderings for the following graph  F6 Madhuri Engineering 22.07.2022 D1 | | | | | | | | | | | | | | | | | | | | | | | | | **CO1** | **L2** |  |
| a) 4 | | | | | b) 5 | | | | | | | | c) 6 | | | | | | | | | | d) 2 | |
| 10. | What is the running time of an unweighted shortest path algorithm whose augmenting path is the path with the least number of edges? | | | | | | | | | | | | | | | | | | | | | | | | | **CO1** | **L2** |  |
| a) O(|E||V|) | b) O(|E|) | | | | | | | | c) O(|E| log |V|) | | | | | | | | | d) O(|E|2|V|) | | | | | | |
| **11.** | Bellmann ford algorithm provides solution for \_\_\_\_\_\_\_\_\_\_\_\_ problems. | | | | | | | | | | | | | | | | | | | | | | | | | **CO1** | **L2** |  |
| a) Network flow | | | | b) Single source shortest path | | | | | | | | c) All pair shortest path | | | | | | | | | d) Sorting | | | |
| **12.** | What approach is being followed in Floyd Warshall Algorithm? | | | | | | | | | | | | | | | | | | | | | | | | | **CO1** | **L2** |  |
| a) Linear Programming | | | | | | | | | b) Backtracking | | | | | | | | | | | | | | | |
|  | c) Greedy technique | | | | | | | | | d) Dynamic Programming | | | | | | | | | | | | | | | |
| **13.** | The general method to solve the single-source shortest-path problem is known as Dijkstra’s algorithm is a prime example of a | | | | | | | | | | | | | | | | | | | | | | | | | **CO1** | **L2** |  |
| * a) Linear Programming | | | | | | | | | | | | | | * b) Backtracking | | | | | | | | | | |
| * c) Greedy technique | | | | | | | | | | | | | | * d) Dynamic Programming | | | | | | | | | | |
| **14.** | The average and best-case running time of the Rabin-Karp algorithm is \_\_, but its worst-case time is \_\_\_. | | | | | | | | | | | | | | | | | | | | | | | | | **CO1** | **L2** |  |
| a)O(n+m) and O(n) | | | | | b) O(n+m) and O(n+m) | | | | C) O(n+m) and O(nm) | | | | | | | | | | | d) O(nm) and O(n) | | | | |
| **15.** | The \_\_\_\_\_\_ case of the Rabin-Karp algorithm occurs when all characters of pattern and text are the same as the hash values of all the substrings of T[] match with the hash value of P[]. | | | | | | | | | | | | | | | | | | | | | | | | | **CO1** | **L2** |  |
| a)Worst | | | | b)Best | | | | | | | | c)Average | | | | | | | | | d)All case | | | |
| **16.** | The time complexity of the KMP algorithm is O(n+m) in the worst case | | | | | | | | | | | | | | | | | | | | | | | | | **CO1** | **L2** |  |
| a)True | | | | | | | | | | b) False | | | | | | | | | | | | | | |
| **17.** | We calculate values in lps[] To keep track of the length of the longest \_\_\_\_\_\_ value for the previous index | | | | | | | | | | | | | | | | | | | | | | | | | **CO1** | **L2** |  |
| 1. Prefix suffix | | 1. Suffix prefix | | | | | 1. Suffix suffix | | | | | | | | | | 1. Prefix prefix | | | | | | | |
| **18.** | 2-3 tree is a specific form of \_\_\_\_\_\_\_\_\_ | | | | | | | | | | | | | | | | | | | | | | | | | **CO1** | **L2** |  |
| a) B – tree | | | | | b) B+ – tree | | | | | | c) AVL tree | | | | | d) Heap | | | | | | | | |
| **19.** | Which of the following is not true about the 2-3 tree? | | | | | | | | | | | | | | | | | | | | | | | | | **CO1** | **L2** |  |
| a)all leaves are at the same level | | b)it is perfectly balanced | | | | | c)postorder traversal yields elements in sorted order | | | | | | | d)it is B-tree of order 3 | | | | | | | | | | |
| **20.** | AVL trees provide better insertion than 2-3 trees. | | | | | | | | | | | | | | | | | | | | | | | | | **CO1** | **L2** |  |
| 1. True | | | | | | | | | | | 1. False | | | | | | | | | | | | | |