**Academic year 2022-23**

**Questions from Tree, graph, Searching, sorting, Hashing**

**Direct Second Year-All Branches**

**Subject: Data structures and algorithms**

**Subject Incharge: Deepali Patil Date: 24/12/2022**

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| **Sr. No** | **Questions** |
| 1. | Compare Tree and graph |
| 2 | Explain Binary search, Linear search, Fibonacci search algorithm with examples. Also comment on calculation of its time complexity. |
| 3 | Describe an Expression tree with an example. Generate an expression tree for any expression given |
| 4 | Compare BFS and DFS traversal techniques. |
| 5 | What is a graph? Explain methods to represent graph |
| 6 | What is hashing? Using Linear probing and quadratic probing insert the following values in the hash table of any size.. Show how many collisions occurred in each iteration.: any set of integer values |
| 7 | Explain different types of tree traversal techniques with examples. Also write a recursive function for each traversal technique. |
| 8 | Insert the following elements in the AVL tree: set of integer values. Explain different types of rotations that can be used. |
| 9 | Write an algorithm for Merge Sort, insertion sort, selection sort with example. |
| 10 | Explain different cases for insertion/deletion/search of a node in binary search tree. Write an algorithm/function for the same.. |
| 11 | What are the different tree terminologies (depth.height, degree etc) |
| 12 | Write properties of Heap. Also build Max heap for the following array (any type of example can come) |
| 13 | What is a collision? What are the methods to resolve collisions? Explain any one with example |
| 14 | What is a binary search tree? Construct Binary search tree for the following elements-set of integer values. |
| 15 | Explain different types of graph traversal techniques with examples. |
| 16 | Define Hashing. Explain various hash functions used in data structure. |
| 17 | Explain Extendible hashing with an example. |
| 18 | Compare static hashing and dynamic hashing. |
| 19 | Explain Rehashing with an example. |
| 20. | Compare Merge sort and quicksort. |