### SIPNA COLLEGE OF ENGINEERING & TECHNOLOGY, AMRAVATI

### Department of Computer Science and Engineering

### Session 2023-2024

### Year/Sem/Section: Third /5th /Open Elective

### Subject: Data Structure and Algorithm

### Final Question Bank of Unit 1 to Unit 6

|  |  |  |
| --- | --- | --- |
| **Question No.** | **Questions** | **BT Level** |
| 1 | Define data structure with its different types. | 1 |
| 2 | What is time and space complexity of algorithm. | 2 |
| 3 | How algorithm is represented. | 2 |
| 4 | Elaborate  (a)insertion, (b) deletion, © traversing, (d)searching and (e)sorting data structure operations in detail. | 6 |
| 5 | Explain asymptotic notations. | 2 |
| 6 | Discuss primitive and non primitive Data Structure. | 6 |
| 7 | List the characteristics of Algorithm. | 2 |
| 8 | Explain the following:   1. Array 2. One-dimensional Array 3. Two dimensional Array 4. Multi-dimensional Array | 1 |
| 9 | Define **linked list** and its different **types**. | 2 |
| 10 | Write an algorithm for searching an element in to an array. (7) | 6 |
| 11 | Elaborate representation of multi-dimensional array in memory. | 6 |
| 12 | Write and algorithm for inserting an element at the end of linked list. | 6 |
| 13 | Explain memory representation of one dimensional array. | 2 |
| 14 | Illustrate the term circular linked list | 2 |
| 15 | Explain the concept of doubly linked list. | 2 |
| 16 | What are different applications of stack | 1 |
| 17 | Elaborate **queue** with its different **types**. | 6 |
| 18 | Compare stack and queue. | 5 |
| 19 | Explain Push( ) and Pop( ) operations of stack. | 2 |
| 20 | The contents of a stack S are as follows:   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Stack S | 9 | 2 | 7 | 4 |  |  |  |  | | Index | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |   The stack can store a maximum of eight elements and the top pointer currently points at index 3. Determine the stack contents and indicate the position of the top pointer after each of the following stack operations:   1. Push (S,8) (b) Push (S, 9) (c) Pop (S) (d) Pop (S) | 5 |
| 21 | Differentiate between circular queue and priority queue. | 4 |
| 22 | What is tree data structure? Elaborate various terms associated with tree | 1 |
| 23 | Find preorder, inorder and postorder traversing sequence of given tree.  Tree | 2 |
| 24 | Draw and elaborate expression tree | 2 |
| 25 | Explain the use of threaded binary tree. | 2 |
| 26 | What is m-way tree? | 1 |
| 27 | Explain Binary Search Tree with example. | 2 |
| 28 | Illustrate the use of AVL tree | 2 |
| 29 | What is balanced binary tree. | 1 |
| 30 | Explain the concept of Red Black tree | 2 |
| 31 | Explain BFS and DFS traversals of the graph using proper example. | 2 |
| 32 | Explain all the methods of Implementation of graph with an example. | 2 |
| 33 | Illustrate shortest path algorithm of graph with the help of an example. | 2 |
| 34 | What is a graph? Describe the terminologies of graph by giving example. | 1 |
| 35 | Elaborate path matrix implementation of graph | 2 |
| 36 | How graph is implemented using adjacency list implementation method. | 1 |
| 37 | Write short notes on adjacency matrix implementation of graph. | 1 |
| 38 | Apply bubble sort algorithm for following numbers stored in array A: 32, 51, 27, 85, 66, 23, 13, 57 | 3 |
| 39 | Determine the location of ITEM Item 32 in given array elements using Binary Search Algorithm:  21, 32, 40, 43, 50, 54, 65, 70, 76, 87, 90, 98 | 5 |
| 40 | Explain selection sort with example. | 2 |
| 41 | Elaborate the concept of merge sort. | 6 |
| 42 | Explain linear search technique in detail with example. | 2 |
| 43 | What are various sorting techniques? | 1 |
| 44 | Apply selection sort algorithm for following numbers stored in array A: 32, 51, 27, 85, 66, 23, 13, 57 | 3 |
| 45 | Apply merge sort algorithm for following numbers stored in array A: 32, 51, 27, 85, 66, 23, 13, 57 | 3 |
| 46 | How can we use bucket sort algorithm to sort given array? | 1 |
| 47 | Define hashing with its application. | 2 |
| 48 | Illustrate insertion sort technique in detail. | 2 |

**Subject Teacher**

**Prof. S.A.Sakhare**