

Aryan College

Data Structure and Algorithms

Unit I:

Fundamental Notations

1. What is Time Complexity? (2015)
2. What is difference between structure and union? (2017,2015)
3. Explain primitive and composite data types with examples. (2017,2015,2013)
4. What is Big- O complexity? (2014)
5. What is theta complexity? (2014)
6. What is small omega complexity? (2014)
7. What is complexity of algorithm? (2013)
8. What is an algorithm? What are the characteristics of good algorithm? (2016)
9. Explain time and space complexity of algorithms with suitable example? (2017)

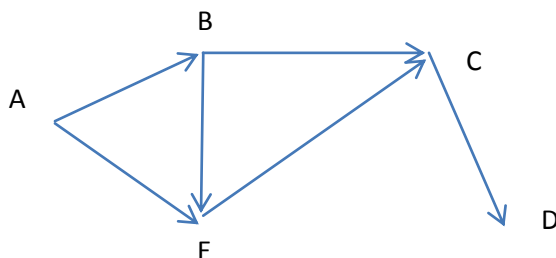
Unit II:

Data Structures

10. What is an Array? (2015)
11. What is a Tree? (2015)
12. What is graph? Define all types of graph with diagram? (2017, 2015,2013)
13. Find postfix equivalent of prefix: (2015)

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14. What is relationship between sum of all the degrees of graph and the number of edges in the graph? (2015)
15. Which traversal technique displays the nodes of binary search tree in ascending order? (2015)
16. What are the differences between stack and queue? (2015)
17. What is recursion? Give Example? (2017,2015,2013)
18. What are the differences between BFS and DFS algorithms? (2015)
19. What is adjacency matrix? Explain with example. (2015)
20. What is incidence matrix? Explain with example. (2015)
21. Explain in-order and post-order traversing algorithms with example? (2015)
22. How many edges are there for a connected graph with 5 nodes and sum of degree of all edges equals to 10? (2014)
23. Explain stack with its algorithm and diagram for all stack functions? (2014)
24. Explain queue with its algorithms and diagrams for all queue functions? (2014)
25. Explain malloc and calloc functions with their syntax and example? (2017,2014)
26. Explain functions of C which are used to change size of memory allocated to pointers? (2014)
27. Write a program in C to print factorial using recursion? (2014)
28. Write in-degree and out-degree of all vertices of the following di-graph: (2014)



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29. Explain Breadth First Search (BFS) algorithm and explain it with suitable example? (2014,2016)
30. Explain how we can create a De-queue. Write algorithm for it and explain it with suitable diagram? (2017,2014,2013)
31. Define Data Structure? (2013,2017)
32. Write an algorithm for array insertion and deletion? (2013)
33. Define DFS with example? (2013,2016)
34. Difference between LIFO and FIFO? (2013,2017)
35. Define prims algorithm with suitable example? (2017,2013)
36. Define in-order, pre-order and post-order traversal in binary tree with suitable example? (2013)
37. Convert infix notation to postfix notation:

$$A*(B+C)-D/E^{(F*G)}/H$$
(2013)
38. Define a link list with diagram? (2017,2013)
39. What is binary tree? (2013,2016,2017)
40. What is pre-condition of binary searching? (2013)
41. What are the advantages of linked list over arrays? (2017)
42. What is null graph? (2017)
43. Explain Kruskal algorithm with suitable example? (2017)
44. Convert following infix notation to postfix form:

$$X+(Y-Z)/P*Q^{(R*S)}/T$$
(2017)
45. How many queues are needed to implement priority queue? (2016)
46. How do you reference all the elements in one dimension array? (2016)
47. What is the data structure used to perform recursion? (2016)
48. What are the notations used in Evaluation of Arithmetic expressions using prefix and postfix forms? (2016)
49. What is spanning Tree? (2016)
50. What are multidimensional array? (2016)
51. What is advantage of Heap over Stack? (2016)
52. What is postfix notations? (2016)
53. What is difference between Singly Linked List and Doubly Linked List data structure? (2016)
54. Explain inverted lists and multi lists? (2016)

Unit III:

File Structure

1. Explain Indexed Sequential Access Method. (2015,2017)
2. What is the difference between static and dynamic memory allocation? (2013,2017)
3. Explain hashing technique? (2013,2017)
4. What do you understand by file organization? Differentiate between sequential and indexed sequential file organization? (2013)
5. What is file structure? Explain fields, records and files? (2017)
6. Differentiate NULL and VOID? (2016)
7. Differentiate file structure from storage structure? (2016)
8. How does dynamic memory allocation help in managing data? (2016)
9. Discuss problems and benefits of using hashing? (2016)

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Unit VI:

Sorting

1. What is order of bubble sort algorithm? (2015)
2. Which sorting algorithm requires minimum number of swaps in sorting? (2015)
3. Explain selection sort algorithm with suitable example? (2015,2013)
4. Explain insertion sort algorithm with suitable example? (2015,2013)
5. Which sorting algorithm is efficiently used in a card game player to arrange cards? (2014)
6. Which sorting algorithm is best suitable for randomly generated numbers? (2014)
7. What is order of selection sort? (2014)
8. Write down algorithm for bubble sort and explain it with suitable example? (2014)
9. Write down algorithm for merge sort and explain it with suitable example? (2014,2016)
10. Explain quick sort with suitable example? (2013,2016)
11. What is internal and external sorting? (2017)
12. Explain bubble sorting with an example. Explain the steps by dry run? (2017)

Unit V:

Searching

1. Explain binary search algorithm with example. Also explain its complexity? (2017,2015)
2. Explain linear search algorithm with example. Also explain its complexity? (2016,2015)