

B. C. A. DEGREE EXAMINATION, APRIL 2019
SECOND SEMESTER

COURSE : MAJOR CORE
PAPER : DATA STRUCTURES AND ALGORITHMS
TIME : 3 HOURS
MAX. MARKS: 100

SECTION A

ANSWER ALL QUESTIONS: (20 X 1 = 20)

Choose the best answer:

- Each instruction in an algorithm should be _____.
(a) ambiguous (b) desired (c) repeated (d) precise
- The analysis of algorithms is the determination of _____.
(a) implementation (b) value
(c) computational complexity (d) growth
- The list which contains unused memory cells is called as _____.
(a) Free pool (b) circular list (c) header list (d) two way list
- A linked list whose last node points back to the first node instead of containing the null pointer is called _____.
(a) Linked list (b) stack (c) circular list (d) pointer
- Convert $(a+b)*c/(d-a)$ to prefix form.
(a) /*ab+c-da (b) /+abc*-da (c) /*+abc-da (d) /*+-abcd
- Queues are also called ____ lists.
(a) Random (b) FILI (c) LIFO (d) FIFO
- The root R of the tree T is assigned the level number _____.
(a) 0 (b) 1 (c) 2 (d) -1
- What is the complexity of Heap sort algorithm?
(a) $O(\log_{10}n)$ (b) $O(n\log_2n)$ (c) $O(n)$ (d) $O(2n)$
- In how many ways a graph G is maintained in memory?
(a) 1 (b) 2 (c) 3 (d) 4
- A node is said to be _____ from a node u if there is a path from u to v.
(a) connected (b) reachable (c) adjacent (d) edge

Fill in the blanks:

- A _____ is also called a LIFO system.
- The logical model of a particular organization of data is called _____.
- _____ refers to the situation where one wants to delete data from a data structure that is empty.
- A _____ is a linear collection of data elements, called nodes.

15. In polish notation, the operator symbol is placed _____ the operands.
16. If the elements are entered in the order A,C,B,D into a Queue then the second element to be removed from queue is _____.
17. A terminal node is called a _____.
18. In _____ traversal of tree, T will yield a sorted listing of the elements of T.
19. A _____ is a connected acyclic graph.
20. The _____ of a node u, is the number of edges beginning at u in a directed graph.

SECTION B**ANSWER ALL THE QUESTIONS:****(5 X 2 = 10)**

21. Define an algorithm.
22. Define two-way list.
23. Define Stack.
24. Define Binary Tree
25. Define Graph.

SECTION C**ANSWER ANY EIGHT OF THE FOLLOWING QUESTIONS:****(8 X 5 = 40)**

26. Write the algorithm to generate Fibonacci sequence.
27. Write a short note on various operations on data structures.
28. Explain Selection sort.
29. Write the algorithm to traverse a linked list.
30. Write the algorithm for transforming Infix expression to postfix expression.
31. Explain linked list representation of Queue
32. Explain Inorder traversal algorithm with an example.
33. Explain how will you delete a node in a BST.
34. Write a note on adjacency matrix.
35. Explain Depth First Search algorithm.

SECTION D**ANSWER ANY THREE OF THE FOLLOWING QUESTIONS:****(3 X 10 = 30)**

36. Explain binary search algorithm in detail.
37. Explain Bubble sort algorithm with suitable example.
38. Explain Quick sort algorithm with an example
39. Explain Heap sort with example.
40. Explain Dijkstra's algorithm with an example.
