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(FOR THE CANDIDATES ADMITTED

SUB CODE **23UIT206**

DURING THE ACADEMIC YEAR 2023 ONLY)

REG.NO. :

**N.G.M.COLLEGE (AUTONOMOUS) : POLLACHI**

**END-OF-SEMESTER EXAMINATIONS : MAY 2024**

**B.Sc.(IT)**

**MAXIMUM MARKS: 75**

**SEMESTER: II**

**TIME : 3 HOURS**

**PART - III**

**23UIT206 – DATA STRUCTURES**

**SECTION - A**

**(10 X 1 = 10 MARKS)**

**ANSWER THE FOLLOWING QUESTIONS.**

**MULTIPLE CHOICE QUESTIONS.**

**(K1)**

1. Minimum number of fields in each node of a doubly linked list is \_\_\_\_\_.  
(a) 2                      (b) 3                      (c) 4                      (d) 5
2. What happens when you try to POP an element from an empty stack?  
(a) It returns null                      (b) It returns the top element  
(c) It causes an overflow                      (d) It causes an underflow
3. A Queue follows \_\_\_\_\_ principle.  
(a) LIFO                      (b) Linear Tree                      (c) FIFO                      (d) Ordered array
4. Average case time complexity of the heap-sort algorithm is \_\_\_\_\_.  
(a)  $O(n \log_2 n)$                       (b)  $O(n \log n)$                       (c)  $O(n^2)$                       (d)  $O(n^3)$
5. A path from node to itself is called a \_\_\_\_\_.  
(a) cycle                      (b) loops                      (c) degree                      (d) adjacency

**ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES**

**(K2)**

6. What is meant by recursion?
7. What is an array?
8. Define Deque.
9. Define sorting.
10. What is hashing?

**(CONTD .... 2)**

**SECTION – B****(5 X 5 = 25 MARKS)****ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS. (K3)**

11. a) Describe the concept of arrays in C.  
(OR)  
b) Compare linked list versus arrays.
12. a) Examine stack as an abstract data type.  
(OR)  
b) Discuss the stacks and recursion in detail.
13. a) Summarize the of circular queue functionality.  
(OR)  
b) Determine the applications of queues.
14. a) Evaluate binary tree and its applications.  
(OR)  
b) Investigate the indexed sequential search in detail.
15. a) Explain the selection sort.  
(OR)  
b) Discuss in detail the Kruskal's algorithm.

**SECTION - C****(5 X 8 = 40 MARKS)****ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS. (K4 /K5)**

16. (a) Discuss about array operations.  
(OR)  
(b) describe the dynamic memory allocation.
17. (a) Explain the applications of stacks.  
(OR)  
(b) Discuss the representation of stacks through linked list.
18. (a) Construct the representation of Queues.  
(OR)  
(b) Explain the priority Queues.
19. (a) Summarize the types of trees.  
(OR)  
(b) Discuss the types of tree traversal.
20. (a) Explain the bubble sort and its algorithms.  
(OR)  
(b) Explain the traversal of graphs.

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**ETHICAL PAPER**