



B.E DEGREE EXAMINATIONS: JUNE 2015

(Regulation 2009)

Second Semester

CSE102 : DATA STRUCTURES

(Common to CSE/IT)

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Top down approach is
 - a) Modular programming
 - b) Unstructured
 - c) Object oriented programming
 - d) Agile programming
2. Which is the time complexity of matrix multiplication
 - a) $O(\log N)$
 - b) $O(N^3)$
 - c) $O(N^2)$
 - d) $O(N)$
3. Usually Linked list is implemented using
 - a) Dynamic memory allocation
 - b) Static memory allocation
 - c) Priority queue
 - d) Binary tree
4. Linked list application is
 - a) Parenthesis matching
 - b) Polynomial addition
 - c) Ticket reservation
 - d) Infix to postfix conversion
5. Stack and linked list are
 - a) Linear and non-linear data structures
 - b) Both are linear
 - c) Non- Linear and Linear data structures
 - d) Both are non-linear
6. FIFO principles are followed by
 - a) Queue
 - b) Stack
 - c) Tree
 - d) Linked list
7. Binary Search tree time complexity is
 - a) $O(\log N)$
 - b) $N * O(\log N)$
 - c) $O(N \log N)$
 - d) $O(\log N^2)$
8. Which traversal is the best suited one?

- | | |
|---------------|--------------------------|
| a) Post order | b) Pre order |
| c) In order | d) Max tree construction |
9. Worst case time complexity of merge sort is
- | | |
|------------------|-------------------|
| a) $O(\log N)$ | b) $(N^2 \log N)$ |
| c) $O(N \log N)$ | d) $O(N^2)$ |
10. External sorting is used because of
- | | |
|--------------------------------------|--------------------------|
| a) Inadequacy of primary memory | b) More time for sorting |
| c) Internal sorting is not efficient | d) Less time for sorting |

PART B (10 x 2 = 20 Marks)

11. How will you analyze the algorithm?
12. Write an algorithm which has the time complexity of $O(N^2)$
13. Distinguish between array and linked list
14. What is ADT? Give ADT for an array
15. List out the basic operations on stack
16. What are advantages of circular queue over queue?
17. Construct binary search tree for the input: 114, 35, 76, 163, 48 and 32.
18. Different between binary tree, binary search tree and AVL tree
19. Write a routine to do bubble sort.
20. Define poly phase merge?

PART C (5 x 14 = 70 Marks)

21. a) (i) Distinguish between top down and bottom up approach (7)
(ii) Explain the time complexity of any one problem with a recursive routine. (7)
- (OR)**
- b) (i) What are the important problem types focused by the researchers? Explain any two with examples. (10)
(ii) What is empirical analysis of an algorithm? Discuss its strength & weakness? (4)
22. a) Write an algorithm to create a linked list. Write algorithms for the following in linked list.
- Insert an item at all positions
 - Delete an item in all positions
 - Display the list

(OR)

- b) (i) Write an algorithm to two polynomial additions (7)
(ii) What do you mean by Josephus Problem? Write a note on it. (7)

23. a) Write any four basic operations on queue and explain

(OR)

b) Explain and write an algorithm to do any two stack applications

24. a) Write an algorithm for the following:

- Create AVL tree with all subroutines
- Insert an item
- Delete an item

(OR)

- b) (i) Write a note on priority queue (7)
(ii) Write an algorithm to create a binary search tree with an example (7)

25. a) (i) Explain any two external sorting methods (7)
(ii) Write an algorithm to do binary search. (7)

(OR)

b) Write an algorithm to do quick sort. Explain the steps involved in sorting
23,45,67,12, 48 345, 78 134 and 400
