



ANNA UNIVERSITY COIMBATORE

B.E. / B.TECH. DEGREE EXAMINATIONS : MAY / JUNE 2010

REGULATIONS : 2007

THIRD SEMESTER : ELECTRICAL & ELECTRONICS ENGINEERING

070250005 – DATA STRUCTURES AND ALGORITHMS

TIME : 3 Hours

Max.Marks : 100

PART – A

(20 x 2 = 40 MARKS)

ANSWER ALL QUESTIONS

1. Define Data structure. Give its types with an example
2. Mention the general problem solving techniques.
3. What is program verification?
4. What is an ADT? Give an example
5. What is an activation record?
6. What are the applications of Queue?
7. Swap two adjacent elements by adjusting only the pointers and not the data using singly linked list.
8. Define Complete Binary Tree.
9. State the properties of a binary tree.
10. List out the open addressing hash function.
11. Give 2 examples for hash function.
12. Define sorting. Mention its types.
13. Sort the following elements using Radix sort.  
568, 789, 123, 24, 7, 1, 891, 652, 239
14. Write time complexity of quick sort and insertion sort.
15. Why is the bubble sort called by its name?
16. What is the disadvantage of merge sort?
17. Define strongly connected graph and cyclic graph.

18. What is MST?
19. What is called as articulation point?
20. What are the traversal techniques in graph?

PART – B

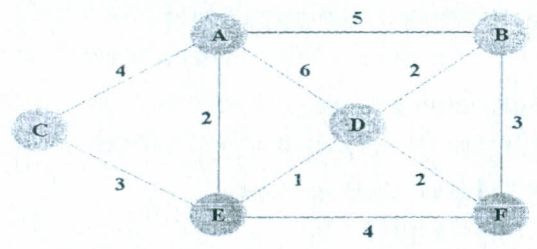
(5 x 12 = 60 MARKS)

ANSWER ANY FIVE QUESTIONS

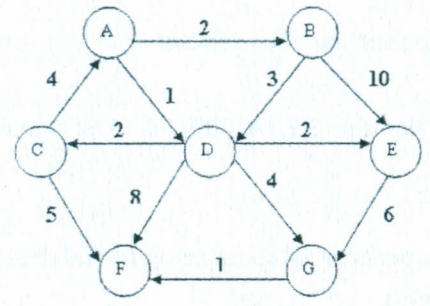
21. a What are the aspects of problem solving? 4  
b Explain in detail about Top down design concept. 8
22. Write an algorithm to convert an infix expression to postfix notation and use it to convert the following expression:  $a+b*c+(d*e+f/g)*h$
23. a Write an algorithm for array implementation of Queue ADT. 8  
b Write about any 3 applications of Linked List 4
24. a Insert the following elements 3,2,1,4,5,6,7, 16,15,14 in to an initially empty AVL tree. 6  
b Write the following algorithms for constructing an AVL tree 6
  1. Single Rotation
  2. Double Rotation
25. Define Hashing. What is called Collision? Explain any 2 collision resolution techniques

26. Write an algorithm to implement heap sort and trace the algorithm for the following 35, 45, 25, 11, 6, 85, 17, 54

27. Construct the MST using Prim's Algorithm for the following Graph



28. Find the shortest path from the vertex A to all other vertices in the graph by using Dijkstra's algorithm



\*\*\*\*\*THE END\*\*\*\*\*