QP CODE : 24788

(3 Hours) Marks : 80

NB : (1) Question **No.1** is **Compulsory.**
(2) Attempt **any three** questions of the remaining **five** questions.
(3) Figures to the right indicate full marks.
(4) Make suitable assumptions wherever necessary with proper justification.

1. (a) Define data structure ? Give its classification. 5
(b) What are the advantages of using dynamic memory allocation over static memory allocation ? 5
(c) Describe Multiway Search Tree with an example. 5
(d) Write a function in C to implement Shell Sort. 5

2. (a) Discuss file I/O operations in C programming language. 8

(b) Write C program to perform polynomial addition using Linked List. 12

3. (a) What are different types of queues ? How can we use the queue data structure for simulation. 10

(b) Write a function to implement Radix Sort. Sort the following numbers using Radix Sort ; 10
25, 10, 68, 19, 75, 43, 22, 31, 11, 59. Show output after each pass.

4. (a) Write a C program to implement a Circular Linked List which performs the following operations : 12
(i) Inserting element in the beginning
(ii) Inserting element in the end
(iii) Deleting the last element
(iv) Deleting a particular element
(v) Displaying the list

(b) Apply Huffman Coding for the word 'MALAYALAM'. Give the Huffman code for each symbol. 8

5. (a) Write a program to evaluate postfix expression. 10
(b) Write a program in C to delete a node from a Binary Search Tree. The program should consider all the possible cases. 10

6. (a) Write a program in C to implement the BFS traversal of a graph. 10
(b) Hash the following elements in a table of size 11. Use any two collision resolution techniques : 10
23, 55, 10, 71, 67, 32, 100, 18, 10, 90, 44 .
