Con. 2489–07. (REVISED COURSE) ND–959

(3 Hours) [Total Marks : 100

N.B. : (1) Question No. **1** is **compulsory**.
   (2) Attempt any **four** questions out of remaining **six**.
   (3) **Figures** to the **right** indicate **full** marks.

1. (a) State and explain the small and big Asymptotic Notations. 8
   (b) Write a program to sort the given n numbers in ascending order using non recursive 12
   merge sort. Also derive its complexity.

2. (a) To prove that complexityof heap sort is $O(n\log_2 n)$. Write a program for heap sort. 12
   (b) Explain the interpolation search. 8

3. (a) Using modulo-division method and linear probing, store the keys shown below in 10
   an array with 19 (ninteen) elements. How many collisions occured ? What is the
   density of the list after all keys have been inserted ?

224562	137456	214562
140145	214576	162145
144467	199645	234534

   (b) Write a program segment to delete element from binary search tree consider all 10
   three cases.

4. (a) A binary tree has eight nodes. The inorder and postorder traversal of the tree is 10
   given below. Draw the tree.
   Postorder : F E C H G D B A
   Inorder   : F C E A B N D G
   (b) What are AVL trees ? Explain with suitable example, of all four cases. 10

5. (a) Draw the B tree of order 3 created by inserting the following data arriving in sequence. 10
   92, 24, 6, 7, 11, 8, 22, 4, 5, 16, 19, 20, 78.
   (b) Explain Topological sorting. 10

6. (a) What is graph ? What are the different applications of graph ? Explain DFS traversal 10
   of graph. Give the algorithm of DKS.
   (b) Explain back tracking method ? Develop an algorithm for finding solution to N-queen 10
   problem.

7. Write note on (any **two**) : 20
   (a) Dynamic programming.
   (b) Greedy methods.
   (c) Digital search trees.