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Roll No. of candidate

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4/3/22

2021

UNIVERSITY OF CENTRAL LIBRARY
2 (10/14-11/17) 5
KODAK 101-1000
GANDHINAGAR, CHENNAI

B.Tech. 5th Semester End-Term Examination

Electrical Engineering

DATA STRUCTURES AND ALGORITHMS BASICS

(New regulation & New Syllabus)

Full Marks – 70

Time – Three hours

The figures in the margin indicate full marks
for the questions.

PART – A

Answer ALL questions

(10 × 1 = 10)

Each question carries 1 mark

1. (a) What do you mean by data structures?
- (b) What are the types of data structures available?
- (c) What do you mean by Big Oh notation?
- (d) What is the recurrence relation Tower of Hanoi problem with n discs?
- (e) What do mean by linear link list?
- (f) How many numbers of comparisons are required in insertion sort to sort a file if the file is sorted in reverse order?
- (g) What do you mean by BST?
- (h) What is a linear search?
- (i) What do you mean by graph?
- (j) The worst-case time complexity of bubble sort is _____.

[Turn over

PART - B

Answer any four questions

Each question carries 15 marks

(4 × 15 = 60)

2. (a) What do you mean by algorithm? What are the good characteristics of a good algorithm?
- (b) Explain about the different types of algorithm complexity? What is the difference between space and time complexity? (8+7)
3. (a) What is the difference between array and link list data structure?
- (b) Write the algorithm or steps to insert an element at the beginning and end of link list. (7+8)
4. (a) Sort the following list of elements using bubble Sort (2, 5, 4,1,3, 9)
- (b) What is the difference between selection and insertion sort?
- (c) What is the time complexities of bubble, selection, and insertion sort in worst case. (8+4+3)
5. (a) What is the difference linear and binary search?
- (b) Explain about the different hashing scheme. (5+10)
6. (a) Explain the push and pop algorithm of stack.
- (b) Write the algorithm to insert an element in a queue.
- (c) What do you mean by adjacency matrix of a graph. Explain with proper diagram. (8+4+3)
7. (a) Explain about the different types of graphs.
- (b) What is the difference between doubly and circular link list.
- (c) Write the algorithm for merge sort (4+4+7)

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