C **Reg. No. :** | | | | | | | | | | |

Question Paper Code: 55804

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2018

Fifth Semester

Information Technology

15UIT504- ANALYSIS AND DESIGN OF ALGORITHMS

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. What is the solution to the recurrence T(n) = T(n/2) + n. CO1- R

   (a) O (log n) (b) O (n) (c) O (n log n) (d) O (n ^ 2)

2. The Merge Sort uses CO2- R

   (a) Divide and Conquer strategy (b) Greedy (c)Array (d) Link List

3. In an optimal Binary search tree CO3- R

   (a) The right subtree contains the values greater than the root

   (b) The left subtree contains the values lesser than the root

   (c) Both a and b are correct

   (d) A only is correct

4. Assignment problem in Branch and Bound method to find Lower Bound (LB) value CO4- R

	J 1	J 2	J 3	J 4
P 1	10	2	7	8
P 2	6	4	3	7
P 3	5	8	1	8
P 4	7	6	10	4

   (a) 10 (b) 12 (c) 18 (d) 15

5. Which of the following algorithm uses pointer doubling concept CO5 R

(a) Dijikstra's algorithm (b) List ranking algorithm

(c) Floyd's algorithm (d) Kruskal's algorithm

PART – B (5 x 3= 15 Marks)

6. State the Euclid's algorithm for finding GCD of two given numbers. CO1- R
7. Define Binary Search CO2- R
8. What is an Optimal Binary Search Trees? CO3- R
9. Define Backtracking Algorithm CO4- R
10. When is a decision problem said to be NP complete? CO5- R

PART – C (5 x 16= 80 Marks)

11. (a) Discuss in detail about fundamentals of algorithmic problem solving. CO1- App (16)

Or

(b) Write the recursive and non-recursive versions of the factorial function. CO1- App (16)

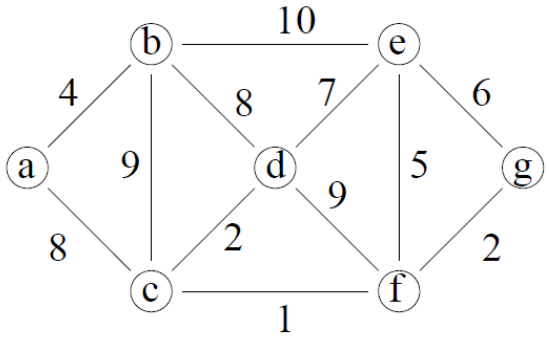
12. (a) Using the divide and conquer approach trace the step of Quick Sort algorithms for the elements CO2- App (16)

57, 70,97,38,63,21,85,68,76,9,81,36, 55, 79,74,85,16,61,77,49,24

Or

(b) Derive the worst case analysis of merge sort using suitable illustrations. 8, 3, 2, 9, 7, 1, 5, 4 CO2- Ana (16)

13. (a) Write and analyze the Prim's Algorithm. Consider the following weighted graph. Give the list of edges in the MST in the order that Prim's algorithm inserts them. Start Prim's algorithm from vertex A CO3 Ana (16)



Or

(b) (i) Explain the computing a binomial coefficient is most efficient? CO3- Ana (8)

(ii) Construct a Huffman code for the following data. CO3- Ana (8)

Character	L	M	C	G	H	F	K	J
Frequency	119	96	247	283	72	77	92	19

Encode the string : CFK

Decode the Huffman code: 1011000011

14. (a) Solve the following instance of the Assignment problem by the branch – and – bound algorithm CO4- App (16)

	Job 1	Job 2	Job 3	Job 4
Person 1	9	2	7	8
Person 2	6	4	3	7
Person 3	5	8	1	8
Person 4	7	6	9	4

Or

(b) (i) Explain 8 queens problem using backtracking along with its state space tree. CO4- U (8)

(ii) Develop Branch and Bound for travelling salesman problem. CO4- App (8)

15. (a) Explain P, NP, NP complete problems with an example CO5- U (16)

Or

(b) Describe about parallel algorithms and list ranking algorithm. CO5- U (16)