STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI 600 086
(For candidates admitted from the academic year 2015-16 & thereafter)

SUBJECT CODE : 15MT/PE/AA14

M. Sc. DEGREE EXAMINATION, APRIL 2019
BRANCH I – MATHEMATICS
SECOND SEMESTER

COURSE : ELECTIVE
PAPER : ANALYSIS OF ALGORITHMS
TIME : 3 HOURS **MAX. MARKS : 100**

SECTION – A

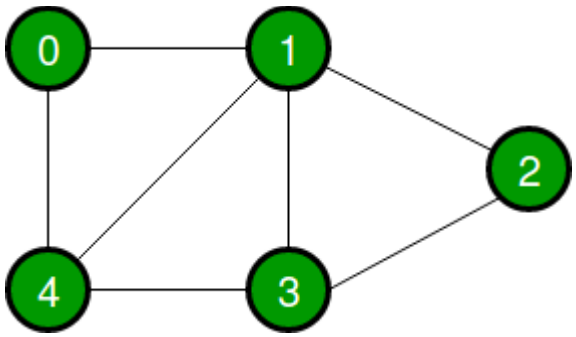
Answer all the questions: **5×2=10**

1. Draw the tournament tree to find the smallest element in the list 4, 6, 3, 2, 8, 7, 1, 5.
2. Compare Binary Search and Sequential Search.
3. State the best and worst case for quick sort.
4. Define Adjacency matrix.
5. What is NP?

SECTION – B

Answer any five questions: **5×6=30**

6. Explain how you measure the growth of an algorithm.
7. Write an algorithm to find the kth largest element in array. Use this algorithm to find the median of the list.
8. Show the results of Insertion sort on 71, 33, 55, 99, 44, 22, 56, 66, 18.
9. For the following graph, give the order that the nodes will be visited when doing BFS traversal starting at the node 4 and write the algorithm for the same.



10. Explain with example NP-complete problems.
11. Write Dijkstra-Prim algorithm.
12. Explain the data structures used to represent a graph.

SECTION – C

Answer any three questions: **3×20=60**

13. Explain how can you measure the efficiency of a recursive algorithm with suitable example.
14. Write and analyse to search for an element in an ordered array.
15. Define a heap. Write an algorithm to sort a list of numbers in ascending order. Trace the algorithm on 23, 17, 21, 3, 42, 9, 13, 1, 2, 7, 35, 4.
16. Write and explain Knuth-Morris-Pratt algorithm and draw the fail links for the pattern ababcb.
17. Explain and write algorithm to check the proposed solution for the Job Scheduling problem is correct.