

Government College of Engineering Aurangabad
(An Autonomous Institute of Government of Maharashtra)

TE (IT) FT Examination

End Semester Examination Nov/ Dec 2016

IT-342: Computer Algorithms

Time: Three Hours **15, NOV 2016** Max. Marks: 60

"Verify the Course Code & check whether you have got the correct question paper"

N.B:- 1. All questions are compulsory

2. Figures to the right indicate full marks

3. Assume suitable data if necessary & state it clearly

4. Use of non-programmable calculator is allowed

Q.1 Attempt any Two (12)

- i) Explain the best, average and worst case time complexity of binary search.
- ii) Define stack. Explain the operations performed on stack with help of algorithms.
- iii) Draw the heap and sort the array $A = [20, 8, 6, 5, 35, 22, 15]$ using heap sort.

Q.2 Attempt any Two (12)

- i) Sort using a Quick Sort: 22 36 6 79 26 45 75 13 31 62
- ii) Demonstrate merge sort technique with help of an algorithm
- iii) Apply the Strassen's matrix multiplication on: $A = [3, 7; 9, 8]$ and $B = [10, 4; 13, 20]$

Q.3 Attempt any Two (12)

- i) Write an algorithm for knapsack problem using Greedy Method.
- ii) What is minimum spanning tree? Explain Prim's algorithm with example.
- iii) Find an optimal binary merge pattern for ten files with lengths: 28, 2, 12, 5, 8, 4, 53, 3, 11

Q.4 Attempt any Two (12)

- i) Illustrate 0/1 Knapsack problem using dynamic programming.
- ii) What is Multi Stage Graph Problem? How does dynamic problem help in solving it?
- iii) Explain All pairs Shortest Path problem with example.

Q.5 Attempt any Two (12)

- i) How does backtracking helps in solving 8 queens problem?
- ii) Illustrate the travelling salesperson problem using branch and bound.
- iii) Explain Hamiltonian cycles.