Reg. No.															

B.Tech. DEGREE EXAMINATION, MAY 2018

1st to 6th Semester

15CS204J – ALGORITHM DESIGN AND ANALYSIS

(For the candidates admitted during the academic year 2015 – 2016 onwards)

Note:

(i) **Part - A** should be answered in OMR sheet within first 45 minutes and OMR sheet should be handed over to hall invigilator at the end of 45th minute.

(ii) **Part - B** and **Part - C** should be answered in answer booklet.

Time: Three Hours

Max. Marks: 100

PART – A (20 × 1 = 20 Marks)

Answer **ALL** Questions

1. What does the algorithmic analysis count?
   (A) The number of arithmetic operations that are required to run the program
   (B) The number of lines required by the program
   (C) The number of seconds required by the program
   (D) The number of conditions required by the program

2. Let $T(n) = (3n^2 + 2n^2 + 2)\log n$. What is the time complexity?
   (A) $O(n^3)$ (B) $O(n^3 + n^2)$
   (C) $O(n^3 \log n)$ (D) $O(n \log n)$

3. Which sorting algorithm is faster?
   (A) Bubble sort (B) Insertion sort
   (C) Nonlinear sort (D) Quick sort

4. The time factor when determining the efficiency of algorithm is measured by
   (A) Counting micro seconds (B) Counting the number of key operations
   (C) Counting the number of statements (D) Counting the kilobytes of algorithm

5. What is the recurrence for worst case of quick sort and what is the time complexity in worst case?
   (A) Recurrence is $T(n) = T(n-2) + O(n)$ and time complexity is $O(n^2)$
   (B) Recurrence is $T(n) = T(n/10) + T(an/10) + O(n)$ and time complexity is $O(n \log n)$
   (C) Recurrence is $T(n) = 2T(n/2) + O(n)$ and time complexity is $O(n \log n)$
   (D) Recurrence is $T(n) = T(n-1) + O(n)$ and time complexity is $O(n^2)$

6. How do you call the selected keys in the quick sort method?
   (A) Outer key (B) Inner key
   (C) Partition key (D) Pivot key

7. Worst case efficiency of binary search is
   (A) $Log_2 n + 1$ (B) n
   (C) n^2 (D) 2^n

8. Time complexity of Kruskals algorithm in finding the minimum spanning tree of an undirected graph containing *m* vertices and n edges, if the edges are in sorted order
(A) $O(mn)$ (B) $O(m+n)$
(C) $O(m)$ (D) $O(n)$

9. In TSP, we can get all the tours by generating all the permutations of _____ compute the tour lengths and find the shortest among them
(A) n + 1 immediate cities (B) n – 1 intermediate cities
(C) n + 2 immediate cities (D) n – 2 intermediate cities

10. Which of the following is not a backtracking algorithm?
(A) Knight tour problem (B) N-queen problem
(C) Tower of Hanoi (D) M coloring problem

11. What is the time complexity of the Floyd Warshall algorithm to calculate all pair shortest path in a graph with N vertices?
(A) $O(n^2 \log n)$ (B) $\Theta(n^2 \log n)$
(C) $\Theta(n^4)$ (D) $\Theta(n^3)$

12. Which of the following algorithm design technique is used in finding all pairs of shortest distances in a graph?
(A) Dynamic programing (B) Back tracking
(C) Greedy (D) Divide and conquer

13. In which of the following cases N _____ queens problem does not exist.
(A) n = 2 and n = 4 (B) n = 4 and n = 6
(C) n = 2 and n = 3 (D) n = 4 and n = 8

14. A solution that either maximizes or minimizes a given objective function is called an _____.
(A) Optimal solution (B) Feasible solution
(C) Local solution (D) Exact solution

15. What is an optimal Huffman code for alpha beta of the following set of frequencies a:05, b:48, c:07, d:17, e:10, f:13?
(A) 1010 (B) 0101
(C) 1001 (D) 1100

16. Which of the following is not used to solve a 0-1 knapsack problem?
(A) Greedy (B) Dynamic programming
(C) Branch and bound (D) Divide and conquer

17. Which of the following does not exist in complexity theory?
(A) Best case (B) Worst case
(C) Average case (D) Null case

18. Assuming P! = NP, which of the following is true?
(A) NP hard = NP (B) NP complete = P
(C) NP = ϕ (D) NP complete up = ϕ