

Please check that this question paper contains 9 questions and 2 printed pages within first ten minutes.

EVENING

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Uni. Roll No.

Program: B.Tech. (Batch 2018 onward)

Semester: 6th

Name of Subject: Design and Analysis of Algorithm

Subject Code: PCIT-113

Paper ID: 17205

Time Allowed: 03 Hours

Max. Marks: 60

NOTE:

- 1) Parts A and B are compulsory
- 2) Part-C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice
- 3) Any missing data may be assumed appropriately

Part – A

[Marks: 02 each]

Q.1.

- a) What is an algorithm?
- b) Explain the term dynamic programming?
- c) How can you prove a problem to be NP complete?
- d) What is the difference between polynomial and exponential running time?
- e) What is the time complexity of algorithm finding all pair shortest path?
- f) Describe minimal spanning tree.

Part – B

[Marks: 04 each]

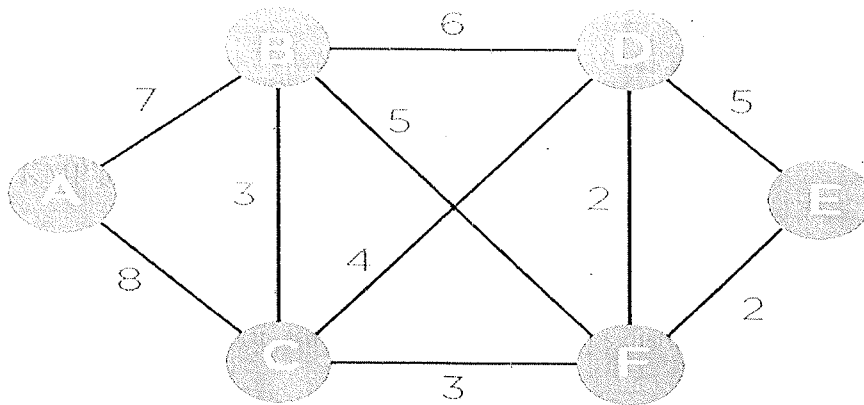
- Q2. Explain divide and conquer principal using Quick sort.
- Q3. Write a short note on approximation algorithms.
- Q4. What is the significance of Big-oh, Omega and theta?
- Q5. What is the relationship among P, NP and NP complete problems? Show with the help of a diagram
- Q6. Compare and contrast Prim's and Kruskal's Algorithm.
- Q7. Describe the functionality of Rabin-Karp algorithm.

Q8. Explain KMP algorithm in detail with suitable example.

OR

Describe how an array of elements can be sorted using Quick Sort algorithm. Show that the running time of Quick Sort is $O(n^2)$ when the array A contains distinct elements and is sorted in decreasing order.

Q9. Write Kruskal's algorithm to find minimum spanning tree. Find the minimum spanning tree for the following graph using Kruskal's algorithm.



OR

What is Backtracking algorithm? Solve Sum of Subsets problem using Backtracking algorithm.
