



AJEENKYA

D Y PATIL UNIVERSITY

End Term Examinations (December 2018)

School: School of Information Technology

Program: B.Tech. - Data Science

Course: Analysis and Design of Algorithms

Course Code: CSC 240

Semester: Third

Max Marks: 30

Duration (mins): 60

Note- 1. Figures to the right indicates full marks.

2. Attempt any three questions.

Q1. a) Define Algorithm and write five criteria's for writing an algorithm (2)

b) Illustrate asymptotic notations. (3)

c) Sort the given array with the help of bubble sort and write its complexity. (5)

{89, 45, 68, 90, 29, 34, 17}

Q2. a) Mark is driving around the one way system in London. The following table shows the (5)

times (in minutes) for Mark to drive between four places A, B, C & D. Mark decides to start from A, drive to the other three places and then return to A. Mark wants to keep his driving time to a minimum.

i. Find the length of tour ABCDA

ii. Find the length of tour ADCBA

iii. Find the length of the tour using the nearest neighbor algorithm starting from A.

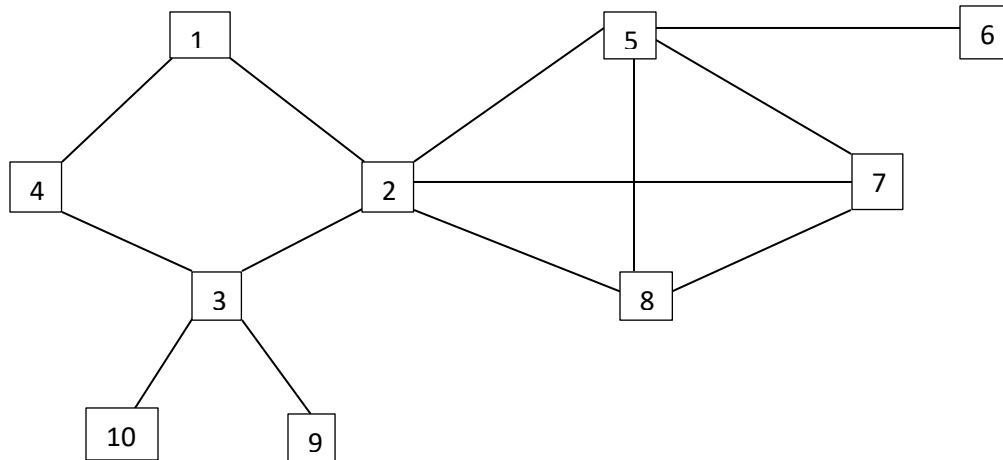
	A	B	C	D
A	-	8	6	11
B	14	-	13	25
C	14	9	-	17
D	26	10	18	-

b) Solve the following recurrence relation through Master theorem: (5)

i. $T(n) = 3T(n/2) + n^2$

ii. $T(n) = 2T(n/2) + n \log n$

- Q3. a) Define the following terms: Adjacency lists and adjacency matrix. (2)
 b) Differentiate between Depth First Search and Breadth First Search. (3)
 c) Solve the following graph through Depth First Search. (5)



- Q4. a) Write an algorithm for Fibonacci of a number with recursion and explain its complexity. (5)
 b) Define the following terms: Cycle, Outdegree, Indegree, Forest, Weighted graph (5)

- Q5. a) Define Huffman Coding and draw huffman tree for the following input: (5)

Character	a	e	i	r	p	s
Frequency	5	45	13	12	9	16

- b) Calculate Minimum spanning tree cost using Prim's algorithm. (5)

