National University of Computer and Emerging Sciences, Lahore Campus

Course:	**Design and Analysis of Algorithms**	**Course Code:**	**CS302**
Program:	**BS(Computer Science)**	**Semester:**	**Spring 2018**
Duration:	**10 Minutes**	**Total Marks:**	**10**
Paper Date:	**8-May-18**	**Weight**	**3**
Section:	**E**	**Page(s):**	**1**
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Exam:	**Quiz 6(b)**	**Section:**	

Professor Gaedel has written a program that he claims implements Dijkstra's algorithm. The program produces values of *d* and π for each vertex v in V. Give an O(V +E) time algorithm to check the output of the professor's program. Given the graph G, d and π, it should determine whether the d and π attributes match those of some shortest-paths tree of G (i.e whether they are correct or not). You may assume that all edge weights are nonnegative. Explain your algorithm in 2-3 lines.