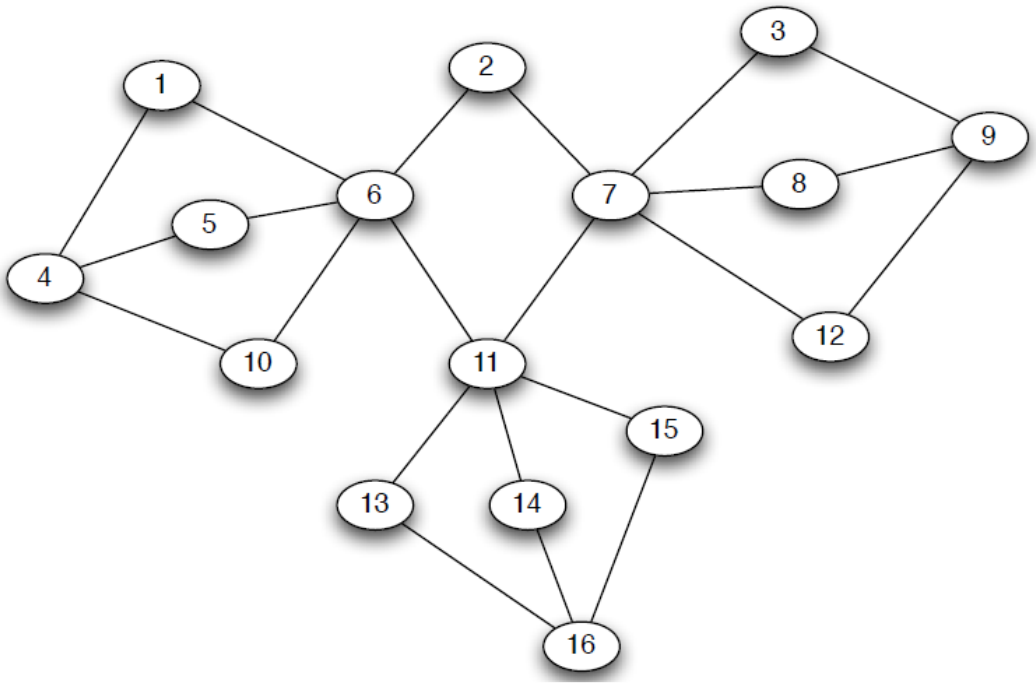
National University of Computer and Emerging Sciences, Lahore Campus

	Course:	**Social Network Analysis**	**Course Code:**	**DS5115**
	Program:	**MS(Data Science)**	**Semester:**	**Spring 2019**
	Duration:	**10 Minutes**	**Total Marks:**	**10**
	Paper Date:	**4-April-19**	**Weight**	**3**
	Section:	**MS(DS)**	**Page(s):**	**1**
	Exam:	**Quiz 3**	**Roll No:**	

Consider the following graph/network



Recall the diffusion model of information cascade where nodes trying to choose between behavior A and B to maximize their payoff. Two nodes v and w gets the payoff:

- a if both are using behavior A
- b if both are using behavior B
- 0 otherwise

Suppose initially everyone is using behavior B and then a new behavior A is introduced. This behavior has a threshold of q = 1/2: any node will switch to A if at least 1/2 of its neighbors are using it. Given the above network

a. How many minimum number of nodes are required as initial adopters of A such that behavior A will spread to all nodes?
b. What is that minimum set of initial adopters for which behavior A will spread to all nodes?