

**NATIONAL UNIVERSITY OF SCIENCES AND TECHNOLOGY**  
**COLLEGE OF ELECTRICAL AND MECHANICAL ENGINEERING**  
**DIGITAL SYSTEM DESIGN**  
**ASSIGNMENT 1**  
**DE31 (EE)**

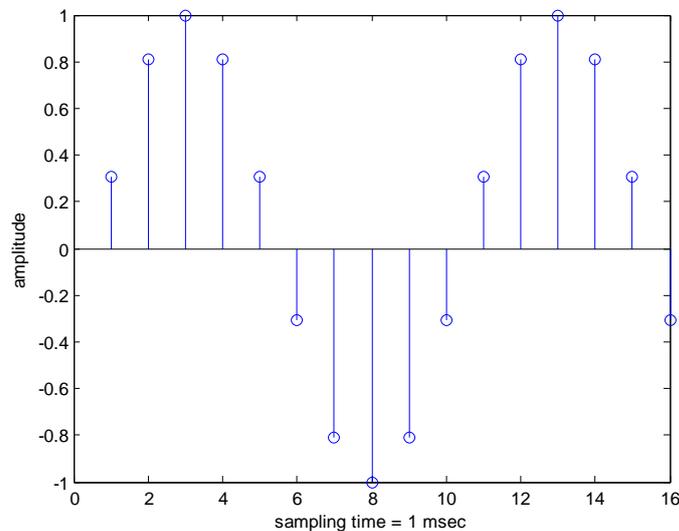
Submission: 23 Sep 2011  
 Instructor: Dr Shoab A. Khan

**Problem Solving**

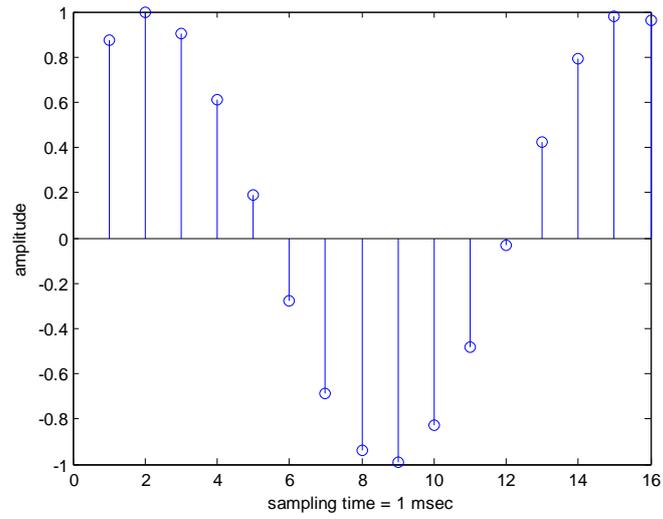
**Objective:** The objective of the assignment is to make students understand that problem solving is the objective of most of the engineering work. Electrical and Computer engineers usually are encountered with problems that require algorithm development. The algorithms are then implemented in HW or SW.

**Problem Statement:**

Design a system that can estimate Amplitude, frequency, and phase of a sinusoid from its 16 samples. The design should be simple to implement and must not require any complex processing for easy implementation in HW. Check your design for the following set of values. Assume sampling rate is 1 msec.



0.3090	0.8090	1.0000	0.8090	0.3090	-0.3090
-0.8090	-1.0000	-0.8090	-0.3090	0.3090	0.8090
1.0000	0.8090	0.3090	-0.3090		



0.8763	0.9995	0.9048	0.6129	0.1874	-0.2790
-0.6845	-0.9409	-0.9921	-0.8271	-0.4818	-0.0314
0.4258	0.7902	0.9823	0.9603		