

King Fahd University of Petroleum and Minerals  
College of Computer Sciences and Engineering  
Department of Computer Engineering

**COE 353 – Fundamentals of Computer Communications (T111)**

**Homework # 01 (due date: Sunday 09/10/2011 during class period)**

**\*\*\* Show all your work. No credit will be given if work is not shown! \*\*\***

**Problem # 1 (6 points):** Suppose that the data **11010100** is to be transmitted from the source to the destination. Assume the data will be transmitted starting with the leftmost bit (i.e., the bit **1** is transmitted first, then the bit **1**, then the bit **0**, ...). Show the signal shape of the transmitted data for each of the following modulation schemes:

1. Amplitude modulation (use Figure 2-11 convention for transmitting **0**'s and **1**'s)
2. Frequency modulation (use Figure 2-12 convention for transmitting **0**'s and **1**'s)
3. Phase modulation (use the 4-phase convention in Figure 2-14 for transmitting **0**'s and **1**'s)

**Problem # 2 (1 point):** Assume that *even* parity (i.e., *even* VRC) is to be used while transmitting the ASCII character "T" (i.e., **1010010**) to the destination. Show the value of the parity bit that will be transmitted.

**Problem # 3 (3 points):** Assume that an *odd* LRC error detection technique will be used while transmitting the ASCII equivalent of the data block "COE 353" to the destination. Show the value of the parity bit for each transmitted character of the data block as well as the transmitted LRC value and its parity bit (see the example in Figure 2-31).