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

COE 202 – Fundamentals of Computer Engineering (T102)

Homework # 02 (*due date & time: Saturday 05/03/2011 during class period*)

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

Problem # 1 (40 points): Find the decimal equivalent of the number $(110111.101)_2$ when the number is interpreted as:

   i.   **(10 points)**   Unsigned number.
  ii.   **(10 points)**   Signed-magnitude number.
 iii.   **(10 points)**   1's complement signed number.
  iv.   **(10 points)**   2's complement signed number.

Problem # 2 (60 points):
(1) **(36 points)** If <u>7-bit registers</u> are used, show the binary number representation of the decimal numbers (+47), (–47), (+23), and (–23) using the following representation systems:

	+47	–47	+23	–23
Signed magnitude system				
Signed 1's complement system				
Signed 2's complement system				

(2) **(24 points)** Using results from part (1) perform the following arithmetic operations using the indicated representation. For each case, state whether the result is +ive, –ive, or overflow.

a.	47 – 23	Using 1's complement representation
b.	23 – 47	Using 2's complement representation
c.	–47 – 23	Using 2's complement representation