Exercises - Problems Sheet # 5: Number Systems

No. Of Questions: 13 No. Of Pages: 2

- To be submitted on the practical exam day (week 13).
- Students will lose 2 marks if this homework is not delivered on time or found out to be copied.
- The submitted solutions should be handwritten and NOT typed/printed.

Question 1: Convert the following decimal numbers to binary:

a) 164 b) 255 c) 94 d) 68.5625 e) 43.625

Question 2: Redo question 1 but convert the decimal numbers to hexadecimal.

Question 3: Redo question 1 but convert the decimal numbers to octal.

Question 4: Convert the following binary numbers to decimal:

a) 1010 b) 11001 c) 10000 d) 110111.110 e) 10010101.111

Question 5: Convert the following binary numbers to octal:

a) 10110101 b) 110011111 c) 10101001101

d) 1110110.101 e) 01101011100.01100

Question 6: Redo question 5 but convert the binary numbers to hexadecimal.

Question 7: Convert the following Hexadecimal numbers to octal:

a) 4E8 b) 2F1 c) D78 d) 5C0 e) 5BCA

Question 8: Perform the binary addition of:

a) 11 + 11 b) 1001 + 110 c) 10001 + 1111

d) 111001 + 11111 e) 11111 + 11111

Question 9: Perform the binary subtraction of:

a) 10011 - 10001 b) 101000 – 1001 c) 10001 - 1111

d) 111001 - 11111 e) 1001 - 110

Question 10: Derive the truth tables for the following expressions:

a) NOT (A OR B) b) A OR (B AND C) c) (NOT A) OR B

d) (A NAND B) AND C e) (NOT A) AND (A OR (NOT B)

Question 11: Find the 1's and 2's complement of the following:

a) 1011 1011 b) 0101 1000 c) 0110 1101 0111

d) 1011 0110 1101 e) 0001 0110 1010

Question 12: Write a program that reads a number and its base, then asks the user what is the base to which (s)he wants it to be converted to. It should then print the number converted to the new base.

Question 13: How are negative numbers represented in binary? Why? Write a program that reads an integer (a positive or a negative integer) and then prints the binary representation of that integer.

With my best wishes;
Dr. Amr S. Ghoneim