1. Show that NAND is not associative with a truth table.

Z	Y	X	Y↑X	Z↑(Y↑X)	Z↑Y	(Z↑Y)↑X
1	1	1	0	0	0	0
1	1	0	0	0	0	1
1	0	1	0	0	0	0
1	0	0	1	0	0	1
0	1	1	0	1	0	0
0	1	0	0	1	0	1
0	0	1	0	1	1	0
0	0	0	1	0	1	0

$\therefore$ Since the highlighted columns do not match, the NAND operation is not associative.

2. Given two eight bit strings, A = 10110001 and B = 10101100, evaluate the following logical operations:

a. XOR

$A \oplus B = 00011101$

b. NAND

$\overline{AB} = 010111111$