King Saud University **CE 442 Water & Wastewater Treatment**
College of Engineering **First Semester 1426-1427H**
Civil Engineering Department **Section: Dr W. Zahid**

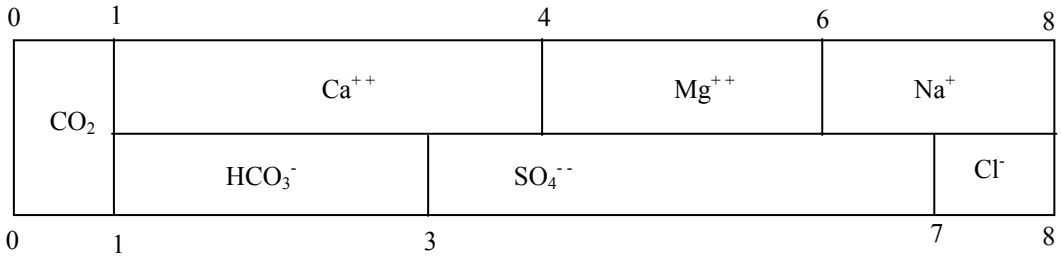
Quiz No. 3

Time allowed: 10 minutes

Name of Student: ……..

No. of Student: ……

The meq/L bar graph of well water is shown below. The water is to be treated by excess-lime softening. Calculate the dosages of lime (CaO) and soda ash (Na_2CO_3) required in mg/L.



$CO_2 + Ca(OH)_2 \rightarrow CaCO_3 \downarrow + H_2O$
$Ca(HCO_3)_2 + Ca(OH)_2 \rightarrow 2CaCO_3 \downarrow + 2H_2O$
$Mg(HCO_3)_2 + 2Ca(OH)_2 \rightarrow 2CaCO_3 \downarrow + Mg(OH)_2 \downarrow + 2H_2O$
$MgSO_4 + Ca(OH)_2 \rightarrow Mg(OH)_2 \downarrow + CaSO_4$
$MgCl_2 + Ca(OH)_2 \rightarrow Mg(OH)_2 \downarrow + CaCl_2$
$CaSO_4 + Na_2CO_3 \rightarrow CaCO_3 \downarrow + Na_2SO_4$
$CaCl_2 + Na_2CO_3 \rightarrow CaCO_3 \downarrow + 2\ NaCl$

Eg. Weight:
CaO = 28 , $NaCO_3$ = 53