Digital Assignment-1:

Section-1 (5 marks)

The students are informed to solve the following numerical problems and find the answers.

1.

A water sample contains 204 mg of $CaSO_4$ per liter. Calculate hardness in terms of $CaCO_3$ equivalent.

2.

A sample of water on analysis has been found to contain following in ppm,

Sr. No.	Impurity	Quantity in ppm
1.	$Ca(HCO_3)_2$	4.86
2.	$CaSO_4$	6.80
3.	$MgSO_4$	8.40

Calculate the temporary and permanent hardness of the water.

3. 0.5 gram of $CaCO_3$ was dissolved in dil. HCl and the solution diluted to one litre (1000ml). 50 mL of this solution required 45 mL of EDTA solution while 50mL of hard water sample required 18 mL of EDTA solution. On the other hand, 50 mL of the boiled sample of hard water when titrated against EDTA consumed 9 mL of the solution. Find out each type of hardness with steps and express it in ppm of $CaCO_3$ equivalents

4. Two water samples A and B were analyzed for their salt contents. Samples A was found to contain 168 mg/L of $Mg(HCO_3)_2$ and 2 gm of $CaCO_3$ per 500 mL. Sample B was found to contain 820 mg/L $Ca(NO_3)_2$ and 2 mg/L of silica. Determine the hardness in all the above water samples in ppm.

5. 25 mL of standard hard water (containing 10g $CaCO_3$ per liter) required 30 mL of EDTA solution for end point. 100 mL of water sample required 20 mL of EDTA solution; while same water after boiling and cooling required 15 mL EDTA solution. Calculate carbonate and non-carbonate hardness of water.

Section-2 (**5 marks**)

Surprise test will be conducted before Cat-1.

Instruction: Complete a test, scan your test paper and upload both sections before the due date.