Short Answer Questions

1. Why are the clay surfaces charged negatively?

2. Why does montmorillonite clay swell more than kaolinite clay?

Calculation Problems

Problem 1

Taken 583.5g dry soil sample for sieve analysis, the weight retained on each sieve is as the second column of Table 1 shows. Determine:

Table 1: Sieve analysis results

Sieve No.	Opening (mm)	Weight Retained (g)	Percentage Retained	Cumulative Percentage Retained	Percentage Finer
4	4.75	16.8			
10	2.0	38.4			
20	0.85	54.9			
40	0.425	67.8			
60	0.25	101.7			
100	0.15	94.2			
140	0.106	77.4			
200	0.075	61.8			
Pan		70.5			

Problem 2

For a given soil sample, the void ratio e, water content w, and specific gravity G, are found to be 0.50, 15%, and 2.65, respectively. Determine:

1. Bulk unit weight γ_b and dry unit weight γ_d
2. Degree of saturation S_r