

**First Mid-Term Examination**

**PROBLEM # 1**

(i) Complete the following sieve analysis table:

Sieve No.	Weight retained on each sieve (g)	Percent of weight retained on each sieve (g)	Cumulative percent retained	Percent finer
4	30	10		
40				30
200				
pan	30			

Total weight =  g

(ii) Answer with a **TRUE** or a **FALSE** to the following statements. If you answer with a FALSE, write the correct statement.

- 1) The void ratio of any soil can not exceed 1.0  
 True  
 False: .....
- 2) In the liquid limit test, the number of blows is inversely proportional to the soil moisture content.  
 True  
 False: .....
- 3) The plastic limit is higher than the shrinkage limit for any soil.  
 True  
 False: .....
- 4) The water content of any soil can not exceed 100%.  
 True  
 False: .....
- 5) In the AASHTO soil classification system, as the group index (GI) increases the quality of performance of a soil as a subgrade material becomes better.  
 True  
 False: .....

### **PROBLEM # 2**

A representative soil specimen collected from the field weighs 1.8 kN and has a volume of  $0.1 \text{ m}^3$ . The water content as determined in the laboratory is 12.6%. The specific gravity of the soil is 2.7.

(a) Determine:

1. Porosity
2. Void ratio
3. Degree of saturation
4. Dry unit weight

(b) Sketch the phase diagram showing all terms with their values.

### **PROBLEM # 3**

Classify the soil shown in the figure below according to the Unified Soil Classification System, given that the liquid limit = 30, and the plastic limit = 26.