Civil Engineering Licensure Exam – Mock Exam (Day 50: Soil Classification and Index Properties)

February 24, 2025

Instructions

- Time Limit: 60 Minutes

- Coverage: Soil Classification and Index Properties

- Total Questions: 10 (Multiple Choice & Problem-Solving)

- Show complete solutions for problem-solving questions.

Section A: Multiple Choice Questions (MCQs)

Choose the best answer.

1. The liquid limit of a soil is defined as:

   (a) The moisture content at which soil changes from plastic to liquid state

   (b) The moisture content at which soil becomes dry

   (c) The water content of fully saturated soil

   (d) The point where soil has no cohesion

2. The plasticity index (PI) of a soil is calculated as:

   (a) The difference between liquid limit and plastic limit

   (b) The sum of liquid limit and plastic limit

(c) The difference between shrinkage limit and plastic limit

(d) The ratio of liquid limit to plastic limit

3. The soil classification system widely used for engineering purposes is:

   (a) Unified Soil Classification System (USCS)

   (b) USDA Soil Taxonomy

   (c) Geological Classification System

   (d) Agricultural Soil Classification

4. A fine-grained soil with a plasticity index greater than 50 is classified as:

   (a) Highly plastic clay (CH)

   (b) Low plasticity silt (ML)

   (c) Non-plastic sand (SP)

   (d) Medium plasticity clay (CL)

5. The specific gravity of soil is defined as the ratio of:

   (a) The unit weight of soil solids to the unit weight of water

   (b) The dry unit weight of soil to its moisture content

   (c) The permeability of soil to its void ratio

   (d) The shear strength to normal stress

Section B: Problem-Solving

1. A soil sample has a liquid limit of 45

2. A soil has a dry unit weight of 16.5 kN/m³ and a moisture content of 12

3. A soil specimen has a void ratio of 0.7 and a specific gravity of 2.65. Determine the dry unit weight assuming the unit weight of water is 9.81 kN/m³.

4. A soil sample has a liquid limit of 50

5. A clayey soil has a shrinkage limit of 15