Civil Engineering Licensure Exam – Mock Exam (Day 33: Structural Loads – Dead, Live, Wind, and Earthquake)

February 24, 2025

Instructions

- Time Limit: 60 Minutes
- Coverage: Structural Loads – Dead, Live, Wind, and Earthquake
- 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. Dead loads in a structure refer to:
   (a) The permanent loads such as walls, floors, and beams
   (b) Loads that vary over time due to occupants
   (c) Temporary construction loads
   (d) Wind loads on a building
2. Live loads in buildings are:
   (a) The weight of the structural frame
   (b) The variable loads such as furniture, people, and equipment
   (c) The weight of the foundation

(d) The loads applied by wind and earthquakes

3. Wind loads on a structure are primarily affected by:

   (a) The density of the concrete used
   (b) The height and shape of the structure
   (c) The weight of the foundation
   (d) The age of the building

4. The base shear in earthquake load analysis is influenced by:

   (a) The mass and stiffness of the structure
   (b) The amount of reinforcement in a column
   (c) The color of the exterior walls
   (d) The number of electrical outlets in the building

5. The fundamental period of a building in seismic analysis is:

   (a) The time taken for the building to be constructed
   (b) The time required for seismic waves to travel through the ground
   (c) The time it takes for a building to complete one cycle of oscillation during an earthquake
   (d) The time needed for wind pressures to stabilize

Section B: Problem-Solving

1. A concrete floor slab has a thickness of 200 mm and a unit weight of 24 kN/m^3. Determine the dead load per square meter of the slab.

2. A residential building has a live load of 2.0 kN/m^2 and a floor area of 100 m^2. Determine the total live load acting on the floor.

3. A high-rise building is subjected to a wind pressure of 1.5 kN/m^2 on its windward face. If the building has a width of 30 m and a height of 100 m, determine the total wind force acting on the building.

4. A building has a seismic weight of 5000 kN and is located in a zone where the seismic coefficient is 0.2. Determine the base shear force due to earthquake loading.

5. A building has a fundamental period of 1.5 seconds. Using the empirical formula for a reinforced concrete moment-resisting frame, estimate the height of the building assuming $T = 0.075H^{3/4}$.