# Civil Engineering Licensure Exam – Mock Exam (Day 23: Cost-Benefit Analysis and Economic Feasibility Studies)

February 24, 2025

## Instructions

- Time Limit: 60 Minutes
- Coverage: Cost-Benefit Analysis and Economic Feasibility Studies
- 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 main objective of cost-benefit analysis (CBA) is to:
   (a) Determine the financial worth of a project
   (b) Compare benefits and costs to assess project feasibility
   (c) Estimate only the costs of a project
   (d) Measure inflation rates over time
2. The benefit-cost ratio (BCR) is given by:
   (a) $BCR = \frac{\text{Total Costs}}{\text{Total Benefits}}$
   (b) $BCR = \frac{\text{Total Benefits}}{\text{Total Costs}}$
   (c) $BCR = \text{Net Present Value} \times \text{Discount Rate}$

(d) $BCR = \text{Total Benefits} - \text{Total Costs}$

3. A project is considered economically feasible if its BCR is:

   (a) Less than 1

   (b) Equal to 1

   (c) Greater than 1

   (d) Negative

4. The payback period of a project refers to:

   (a) The time required to recover the initial investment

   (b) The duration of project construction

   (c) The present value of benefits over time

   (d) The number of years a project will last

5. Sensitivity analysis in economic feasibility studies is used to:

   (a) Assess the impact of changes in key variables

   (b) Determine the construction schedule

   (c) Calculate the final project cost

   (d) Estimate the expected maintenance cost

## Section B: Problem-Solving

1. A project has an initial investment cost of $500,000 and is expected to generate annual benefits of $120,000 for 6 years. Compute the benefit-cost ratio if the discount rate is 8%.

2. A company invests $1,000,000 in a highway improvement project. The total economic benefits over 10 years are estimated at $1,500,000. Determine the benefit-cost ratio and assess the feasibility of the project.

3. A hydropower plant has an initial cost of $4,000,000 and is expected to generate annual savings of $500,000. Determine the payback period.

4. A bridge construction project has a total cost of $2,000,000, and its expected annual benefits are $300,000. If the discount rate is 6

5. A firm conducts sensitivity analysis on a road construction project with an estimated cost of $800,000. If the maintenance cost increases by 15