Solutions to Civil Engineering Licensure Exam – Engineering Contracts and Specifications

February 24, 2025

March 2, 2025

1 Multiple Choice Questions (MCQs)

1. **A contract in which the contractor is paid based on the actual cost of work plus a percentage of the cost as profit is called:**

   Solution: (b) Cost-plus contract.

   Video Explanation: Contracts for Engineers

2. **The term "specifications" in engineering contracts refers to:**

   Solution: (b) The detailed technical requirements of materials, workmanship, and execution.

   Video Explanation: Contract Documents Drawings and Specifications

3. **A bid bond is required in construction contracts to:**

   Solution: (b) Guarantee that the contractor will enter into the contract if awarded the project.

   Video Explanation: Contract Law - Guidance for Engineers

4. **A performance bond is used in engineering contracts to:**

   Solution: (a) Ensure that the contractor completes the project as per contract requirements.

   Video Explanation: Contracts for Engineers

5. **The term "liquidated damages" in a contract refers to:**

   Solution: (a) The penalty charged to the contractor for project delays.

   Video Explanation: Contract Law - Guidance for Engineers

2 Problem-Solving

1. **A contractor signs a lump-sum contract for $500,000 to complete a bridge project in 180 days. If the project is delayed by 20 days and the contract specifies liquidated damages of $2,000 per day, determine the total penalty the contractor must pay.**

   Solution: The total penalty is calculated as:

   $$\text{Total Penalty} = \text{Delay Days} \times \text{Liquidated Damages per Day} = 20\,\text{days} \times \$2,000/\text{day} = \$40,000$$

   Video Explanation: Contracts for Engineers

2. **A contractor submits a bid of $750,000 for a project, secured by a 5% bid bond. Determine the amount of the bid bond.**

   Solution: The bid bond amount is calculated as:

   $$\text{Bid Bond Amount} = \text{Bid Amount} \times \text{Bid Bond Percentage} = \$750,000 \times 0.05 = \$37,500$$

   Video Explanation: Contract Law - Guidance for Engineers

3. **A construction project requires 1,000 cubic meters of concrete, with a unit price contract specifying $120 per cubic meter. Determine the total cost of the concrete work.**

   Solution: The total cost is calculated as:

   $$\text{Total Cost} = \text{Quantity} \times \text{Unit Price} = 1,000\,\text{m}^3 \times \$120/\text{m}^3 = \$120,000$$

   Video Explanation: Contract Documents Drawings and Specifications

4. **A project owner requires a 10% performance bond for a $2,500,000 contract. Determine the amount of the performance bond.**

   Solution: The performance bond amount is calculated as:

   $$\text{Performance Bond Amount} = \text{Contract Amount} \times \text{Performance Bond Percentage} = \$2,500,000 \times 0.10 = \$$$

   Video Explanation: Contracts for Engineers

5. **A contractor enters into a cost-plus contract with a fixed fee of 12% of the actual cost. If the actual cost of the project is $800,000, determine the total payment the contractor will receive.**

   Solution: The total payment is calculated as:

   $$\text{Total Payment} = \text{Actual Cost} + (\text{Fixed Fee Percentage} \times \text{Actual Cost}) = \$800,000 + (0.12 \times \$800,000) = \$8$$

   Video Explanation: Contracts for Engineers