Civil Engineering Licensure Exam – Mock Exam (Day 24: Construction Project Scheduling (PERT/CPM))

February 24, 2025

Instructions

- Time Limit: 60 Minutes
- Coverage: Construction Project Scheduling (PERT/CPM)
- 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 Critical Path Method (CPM) is used to:
   (a) Determine the longest path in a project schedule
   (b) Calculate project costs
   (c) Manage labor allocation
   (d) Optimize material use
2. In PERT analysis, the expected duration (T_E) of an activity is given by:
   (a) $T_E = \frac{O+4M+P}{6}$
   (b) $T_E = \frac{O+M+P}{3}$

(c) $T_E = O + M + P$

(d) $T_E = P - O$

3. The float (slack) in a project schedule represents:

   (a) The total time an activity can be delayed without delaying the project

   (b) The total time required to complete an activity

   (c) The number of resources needed

   (d) The cost savings in project scheduling

4. The term "crashing" in CPM refers to:

   (a) Shortening the project duration by adding resources

   (b) Removing unnecessary activities

   (c) Reducing project costs

   (d) Extending the project deadline

5. A project is considered completed on time when:

   (a) It follows the baseline schedule

   (b) The actual duration matches the estimated duration

   (c) The total float is zero

   (d) The critical path remains unchanged

Section B: Problem-Solving

1. A construction project has the following activities with their optimistic (O), most likely (M), and pessimistic (P) durations in days:

Activity	O	M	P
A	3	6	9
B	2	4	6
C	5	8	11
D	4	5	6

   Compute the expected duration for each activity.

2. A project has four activities with the following durations (in days):

Activity	Predecessor	Duration
A	–	5
B	A	7
C	A	6
D	B, C	8

   Determine the critical path and project duration.

3. If activity X has an earliest start time of 12 days and a latest start time of 18 days, determine its total float.

4. A construction project is scheduled to take 30 days, but due to a delay, the contractor decides to crash a critical activity. If the normal duration of the activity is 8 days with a normal cost of \$4,000, and the crash duration is 5 days with a crash cost of \$7,000, determine the cost per day of crashing.

5. A company uses PERT analysis to estimate the duration of a project. If the standard deviation of an activity is 2 days, what is the probability that the project will be completed within one standard deviation of the expected duration?