

**National Exams May 2003**

**98 -Civ-B8, Management of Construction**

**3 hours duration**

**Notes:**

1. If doubt exists as to the interpretation of any question, the candidate is urged to submit with the answer paper, a clear statement of any assumptions made;
2. This is a "Closed Book" exam. Candidates may use one of two calculators, the Casio or the Sharp approved models;
3. Any five questions constitute a complete paper. Only the first five questions as they appear in your answer book will be marked.
4. All questions are of equal value.

**1. Scheduling:**

Given the following project data, calculate and show:

- A. The logic network.
- B. The Critical path.
- C. The late-start Bar Chart.
- D. What is the overall percent complete of the project, to-date?

| Activity | Predecessors | Duration | Cost x<br>\$1,000 | Actual Percent<br>Complete, to-date |
|----------|--------------|----------|-------------------|-------------------------------------|
| A        | ----         | 4        | 4                 | 100%                                |
| B        | A            | 6        | 3                 | 100%                                |
| C        | A            | 2        | 4                 | 70%                                 |
| D        | A            | 9        | 3                 | 50%                                 |
| E        | B            | 3        | 4                 | 15%                                 |
| F        | D            | 7        | 3.5               | ----                                |
| G        | B            | 8        | 2                 | ----                                |
| H        | C, E         | 2        | 2                 | ----                                |
| I        | F            | 4        | 4                 | ----                                |
| J        | G, H, I      | 2        | 6                 | ----                                |

**2. Contract Administration:**

Discuss the project environment that best suits the following contractual approaches: Design-Bid-Build, Turnkey, and BOT. Also, discuss the level of risk carried by both the owner and the contractor organizations in each of the three contractual approaches.

**3. Estimating and Bidding:**

Discuss the competitive bidding process and the major components of a bid price proposal (i.e., direct cost, etc). Describe the bid unbalancing practice of contractors and how it can be detected by owners.

**4. Engineering Economics:**

An appraisal of two alternative projects is being carried out. Given the following cash flow, calculate the most economical plan using present value profit. Use a discount rate of 10% per year.

|   | <u>Project A</u> | <u>Project B</u> |
|---|------------------|------------------|
| <b>Initial Investment</b>                   | \$70,000         | \$85,000         |
| <b>Yearly operating cost</b>                | \$1,500          | \$1,000          |
| <b>Major Maintenance</b><br>(every 4 years) | \$5,000          | \$4,000          |
| <b>Yearly revenue</b>                       | \$12,500         | \$15,000         |
| <b>Life</b>                                 | 12 years         | 12 years         |

**5. Safety Practices and Regulations:**

Construction sites can be considered as being one of the most hazardous types of working environments. Discuss some of the important practices that need to be adopted on the construction site of a high-rise building project to assure an accident-free environment.

**6. Construction Delays:**

Briefly discuss the following: excusable versus non-excusable delays; compensable versus non-compensable delays; and concurrent versus non-concurrent delays. Mention possible ways to minimize disputes over construction claims.