

National Exams Dec 2015

98-Civ-B8, Management of Construction

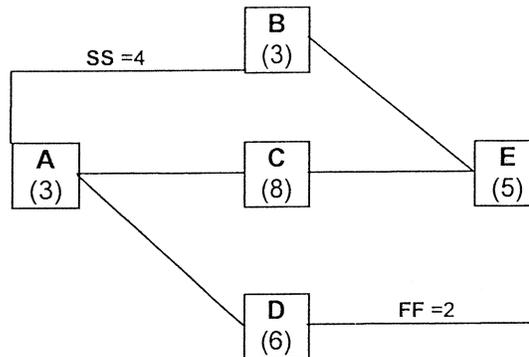
3 hours duration

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:

A small project network is shown below with activities' IDs and durations. Activities A and B have a Start-to-Start relationship with 2 lag days. Also, activities D and E have a Finish-to-Finish relationship with 2 lag days. Calculate the activities' Total Float values, show the critical path, and draw a late bar-chart.



2. Contract Administration:

Discuss the project parties, their responsibilities, contractual arrangements, and suitable contract types in the following cases: Turn-Key power-plant project; fast-track hotel project; and a municipal road project; a high-risk oil exploration project.

3. Project Control:

- Briefly discuss the project's S-Curve and explain its shape;
- Sketch a typical project S-Curve and show the expenses versus expected payment profiles; and
- Explain the performance indices that are used for schedule and cost control.

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 discount rate of 10% per year.

	<u>Project A</u>	<u>Project B</u>
Initial Investment	\$62,000	\$80,000
Yearly operating cost	\$4,500	\$7,000
Major Maintenance	\$15,000 (every 3 years)	\$13,000 (every 4 years)
Life	12 years	12 years

5. Safety Practices and Regulations:

- (a) Discuss the main potential safety hazards on the construction site of a high-rise construction.
- (b) Discuss some of the important practices that need to be adopted to assure an accident-free environment.

6. Estimating:

The main five activities in a highway construction project are shown below:

- (a) Estimate the duration and cost of each activity considering that crews are expected to work with only 70% productivity; and
- (b) Briefly discuss the factors that affect the productivity of crews.

Activity	Quantity	Cost and Production Data
1. Excavation	4200 m ³	Crew production rate = 742 m ³ / day; Cost = \$10 / m ³
2. Sub-base	1200 m ²	Crew production rate = 3,94 m ² / day; Cost = \$1.3 / m ²
3. Base	12000 m ²	Crew production rate = 600 m ² / day; Cost = \$12 / m ²
4. Binder	12000 m ²	Crew production rate = 5,305 m ² / day; Cost = \$5 / m ²
5. Asphalt	7200 m ²	Crew production rate = 8,842 m ² / day; Cost = \$4 / m ²