

National Exams December 2008

98-Civ-B8, Management of Construction

3 hours duration

Notes:

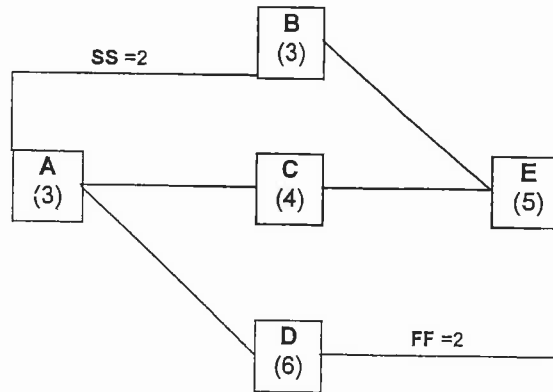
1. If doubt exists as to the interpretation of any question, the candidate is urged to submit with the answer paper, a clear statement of any assumptions made;
2. This is a "Closed Book" exam. Candidates may use one of two calculators, the Casio or the Sharp approved models;
3. Any five questions constitute 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.

Marking Scheme

1. 20 marks
2. 20 marks
3. 20 marks
4. 20 marks
5. 20 marks
6. 20 marks

1. Scheduling:

Perform schedule calculations on the following network and define the critical path. Draw a late bar chart.



2. Estimating:

a) The following table gives the work items of a certain contract together with their estimated quantities and total direct cost. If the total of indirect costs are \$140,000 and the markup is 10%, allocate the indirect costs to the activities and calculate the unit prices. What is the total bid price?

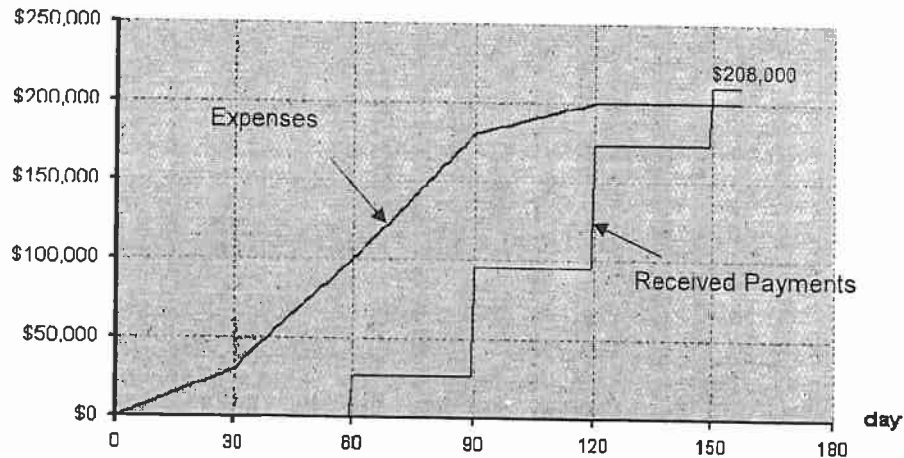
Activity	Quantity	Unit	Direct Cost	Indirect Cost	Unit Price
Common excavation	500,000	m3	\$475,000	?	?
Rock excavation	200,000	m3	\$2,400,000	?	?
Structures	1	LS	\$400,000	?	?

b) The daily production rate of a crew that works in a certain activity is 175 units per day (e.g., m²/day) and the total crew cost per day is \$1,800. The material needed for daily work is 4.5 units (\$100/unit). Calculate the time and cost it takes the crew to finish 1,400 units.

3. 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.

	Project A	Project B
Initial Investment	\$70,000	\$60,000
Yearly operating cost	\$1,000	\$1,500
Major Maintenance (every 3 years)	\$3,000	\$5,000
Yearly revenue	\$14,500	\$15,000
Life	15 years	12 years

4. Cash Flow:

The cash flow diagrams for a small project are shown above, showing the contractor cumulative expenses and the cumulative amounts received from the owner. Estimate the amount of interest charged on borrowed money using an interest rate of 1.5% per month. Also, Estimate the highest amount of cash needed in any month. Briefly discuss three measures to reduce interest charges.

5. Project Control:

- (a) Briefly discuss the project's S-Curve and explain its shape.
- (b) Briefly discuss how the Earned Value approach is used to control the time and cost of projects.

6. 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 highway rehabilitation work zones, particularly during night construction, to assure an accident-free environment.