UNIVERSITY OF TORONTO FACULTY OF APPLIED SCIENCE AND ENGINEERING

Final Examination, April 2001
Third Year—Program: Civil Engineering

CIV 320 S—Management of Construction Exam Type: A

Examiner: Tamer E. El-Diraby

Please read the exam carefully. Allocate time to each question based on its weight.

Write eligibly. State any assumptions you make. Best of Luck.

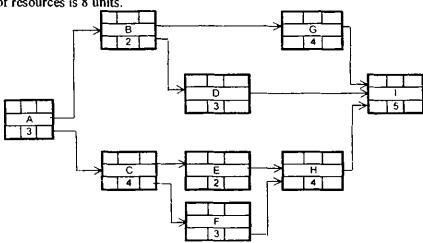
Question 1 (15%)

Answer only two of the following sub-questions:

- What are the techniques that a contractor can use to reduce negative cash flow/overdraft?
- Explain the project manager role in planning for safety in a construction project.
- Explain the major components of project communication/information management plan.

Question 2 (15%)

For the following network find the minimum project duration if the maximum available number of resources is 8 units.



Activity	Resource required
A	4
B	5
C	5
D	4
E	3
F	4
G	6
Н	3
1	1 7

Question 3 (20%)

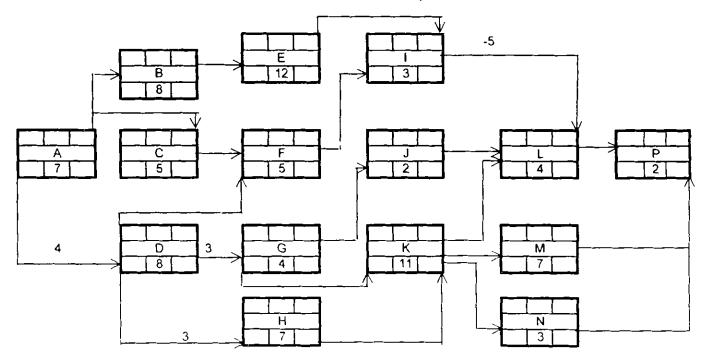
For the following project: overhead =12%, tax=6%, markup= 11% and bond is 1%

- A. Develop a balanced bid
- B. Assuming that you have known that the actual quantities of Excavation and Steel work at the time of estimate are 500 and 150 m³ respectively, and assuming that your manager will allow you to unbalance within +/- 12%, develop an unbalanced bid that will maximize your income.
- C. Calculate the actual markup percentage if you used the unbalanced bid and the quantities turned out to be as shown in section B.

Work Item	Unit	Estimated Quantity	Direct Cost	Balanced price	Balanced unit price	Unbalanced price	Unbalanced unit price	Actual income
Site work	m ²	500	290,000					
Excavation	m³	400	50,000					
Foundations	m ³	200	600,000					
Steel work	m ³	100	300,000					
Brick work	m ²	400	200,000					
Roof	m ²	500	400,000					
		Totals						

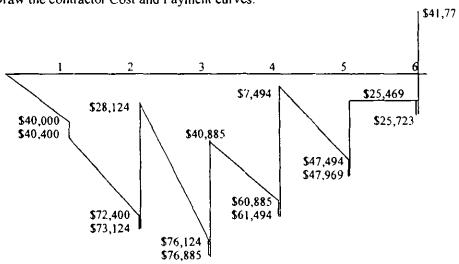
Question 4 (20%)

For the given network, find ES, LS, EF, LF, FF, TF and Critical path.



Question 5 (15%)

The following is the overdraft profile for a 5 month project where Price = 1.25 x Cost, Payment are received after 30 days of Billing with a retainage of 10%, interest rate is 1% per month. Draw the contractor Cost and Payment curves.



Question 6 (15%)

The unit network for a 41-units housing project is shown. The production rates for each activity are shown in the following table.

- A. Draw the Objective chart for this project.
- B. Draw the Line of Balance on day 45.

Activity	Production Rate	
Ā	1	
В	0.5	
C	1	
D	0.5	
E	1	
7	1	
G	1	
H	0.25	
l	i	

