

National Exams Dec 2017

07-Str-B2, 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:

- a) Draw the project network
- b) Calculate total floats and determine the critical path
- c) What is the effect of delaying activity G by 6 days?
- d) What is the overall percent complete of the project, to-date?

Activity	Predecessors and Relation	Duration	Cost x \$1,000	Actual Percent Complete, to-date
A	----	2	5	100%
B	A	4	3	100%
C	----	2	4	75%
D	B	3	2	50%
E	C (FS = 3)	4	4	40%
F	C	10	5	----
G	D	8	2	----
H	E	2	2	----
I	G	4	4	----
J	G	5	3	----
K	H, F	3	3	----

2. Litigation:

Discuss the main reasons for delay-related claims on construction projects and the contractual modifications that can reduce such claims. Also, discuss the various approaches by which a claim can be settled and the types of analyses that need to be performed to validate and judge such claims.

3. Estimating:

- a) Using the following R.S. Means production data, estimate the duration and cost of constructing a wall that requires 2,000 masonry units. Your work crews is made up of 3 skilled workers + 2 helpers:

04800 Masonry Assemblies										
04810 Unit Masonry Assemblies		CREW	DAILY OUTPUT	LABOR-HOURS	UNIT	BARE COSTS				TOTAL
						MAT.	LABOR	EQUIP.	TOTAL	INCL O&P
3000	Jumbo, 6" x 4" x 12" running bond (3.00/S.F.)			.092		3.62	2.93		6.55	8.45

- b) Sketch the typical time-cost relationship for an activity.

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>
Initial Investment	\$30,000	\$25,000
Yearly operating cost	\$1,500	\$1,000
Major Maintenance	\$5,000 (every 3 years)	\$3,000 (every 2 years)
Yearly revenue	\$12,500	\$10,000
Life	6 years	4 years

5. Insurance:

Discuss the differences among bid bonds, performance bonds, and payment retention. Also, discuss the advantages of using union resources in 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.