

# National Exams May 2009

## 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, calculate and show:

- A. The logic network.
- B. The Critical path.
- C. What is the effect of delaying activity G by 5 days?
- D. What is the overall percent complete of the project, to-date?

Activity	Predecessors	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	2	4	20%
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. Estimating:**

You are estimating the cost of drywall for the internal partitions in a small building. The total length of the partitions is 600 feet and the height of the partition is 8 feet. You will use a 5/8" thick drywall with compound skim coat (level 5 finish).

- a) Use the table below to determine the cost and duration of installing the drywall.
- b) Due to the difficult working conditions on site, productivity is estimated to be 75%. Determine the impact on time and cost.

09250 Plaster & Gypsum Board									
09250 Gypsum Board		DAILY LABOR		UNIT	2005 BARE COSTS			TOTAL	
CREW	OUTPUT	HOURS	MAT.		LABOR	EQUIP.	TOTAL	INC. O&P	
0100	DRYWALL Gypsum plasterboard, nated or screwed to studs unless otherwise noted	1 Cap	2,000	.006	SF.	.20	.27	.47	.65
0150	3/8" thick, on walls, standard, no finish included		1,800	.009		.20	.20	.40	.59
0200	On beams, standard, no finish included		675	.024		.20	.20	.40	1.45
0250	5/8" thick, on walls, standard, no finish included		2,000	.006		.24	.27	.51	.69
2050	Taped and finished level 4 finish		955	.017		.23	.57	.80	1.15
3000	With compound skim coat level 5 finish		775	.021		.20	.71	.91	1.43
2100	Fire resistant, no finish included		2,000	.006		.25	.27	.52	.71
2150	Taped and finished level 4 finish		955	.017		.28	.57	.85	1.19
3050	With compound skim coat level 5 finish		775	.021		.25	1.44	1.79	2.64
3500	Fire resistant, no finish included		675	.024		.29	.21	.50	1.55

### **3. Engineering Economics:**

Annual maintenance costs for a particular section of highway pavement are \$3,000. The placement of a new surface would reduce the annual maintenance cost to \$750 per year for the first 5 years and to \$1,000 per year for the next five years. The annual maintenance after 10 years would again be \$3,000. If maintenance costs are the only saving, calculate the maximum investment that can be justified for the new surface, with interest at 4%.

### **4. 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.

### **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.

## Marking Scheme

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