

1. What are the differences among the following types of contracts? Discuss their pros and cons. (16%)

- (a) Lump-sum contract
- (b) Unit price contract
- (c) Cost + Fee
- (d) Guaranteed maximum price

2. What are the differences among the following types of delivery methods? Discuss their pros and cons. (16%)

- (a) Design/Bid/Build
- (b) Design/Build
- (c) CM for Fee
- (d) BOT

3.

What is the full name for PERT? (2%) What is role of PERT in project management? (5%) What is the difference between PERT and CPM (3%)

4.

- (a) What is the difference between total float and free float (2%)
- (b) Create the critical path for the list of tasks above. Use an activity on node representation. For each node, determine, the ES, EF, LS, LF and place these at their respective corners of each node. (18%)

Activity	Duration	Minimum Duration	Precedent Activity	Crash Cost per Day
A	3	2	-	\$400
B	3	3	A	\$200
C	5	2	A	\$200
D	4	4	B	\$300
E	7	5	B,C	\$100
F	11	3	C	\$400
G	9	7	D,E,F	\$100

- (c) Crash the chart above assuming you have \$1500 to spend and that activities cannot be shorter than their minimum durations. Try to achieve the greatest reduction in project duration for the least amount spent (7%)

見背面

5. Suppose that you have been asked to take over as project manager on a small project involving installation of 5,000 meter of metal ductwork in a building. The job was originally estimated to take ten weeks, and you are assuming your duties after three weeks on the project. The original estimate assumed that each meter of ductwork would cost \$10, representing \$6 in labor costs and \$4 in material cost. The expected production rate was 500 meter of ductwork per week. Appearing below is the data concerning this project available from your firm's job control information system:

Week	Weekly Unit Costs (\$/meter)			Quantity Placed (meter)		Total Cost	
	Labor	Materials	Total	Week	To Date	Week	To Date
1	12.00	4.00	16.00	250	250	4,000	4,000
2	8.57	4.00	12.57	350	600	4,400	8,400
3	6.67	4.00	10.67	450	1,050	4,800	13,200

- (a) Based on an extrapolation using the average productivity and cost for all three weeks, forecast the completion time, cost and variance from original estimates. (12%)
- (b) Suppose that you assume that the productivity achieved in week 3 would continue for the remainder of the project. How would this affect your forecasts in (a)? Prepare new forecasts based on this assumption. (6%)

6. If you are buying a truck, then you might make a decision whether to buy from company A or B. Company A asks for \$8,000 at year 0 and \$1,000 for year 1, 2 & 3. Company B asks for \$ 0 at year 0 and \$ 4,000 at year 1,2 & 3. Which company would you choose if interest rate is 10% per year? Use net present value (NPV) to make your decision. (7%)

7. Use two examples to show how "the internet of things" is affecting the construction industry. (6%)

試題隨卷繳回