

1. Please explain the following different types of contracts and their pricing methods. (20%)

- i. Lum-Sum
- ii. Unit Price
- iii. Cost Plus Fee
- iv. Guaranteed Maximum Price

2. Please explain the following different delivery methods. (15%)

- i. Design-Bid-Build
- ii. Design-Build
- iii. Build-Operate-Transfer

3. Based on the following activities, answer the following questions.

Activity	IPA	Duration (days)		Direct cost(\$)	
		Normal	Crash	Normal	Crash
A	-	7	5	500	640
B	A	6	5	550	630
C	A	8	5	800	935
D	B	10	7	1,200	1,440
E	B, C	6	4	600	700
F	C	4	3	500	590
G	D, F	4	2	700	1,000
H	E, F	7	4	650	950
I	G, H	2	2	300	300

IPA: Immediate Predecessor(s)

**** Indirect costs are \$100 per day.**

- i. Draw both the AOA (Activity on Arrow) network and the AON (Activity on Node) network. (10%)
- ii. Based the normal durations, carry out CPM. Find the Critical Path. (5%)
- iii. Calculate the normal duration and normal cost for the project. (10%)
- iv. Calculate the least-cost duration and least-cost for the project. (10%)
- v. Calculate the crash duration and crash cost for the project. (8%)

4. The mark-up for the following project is 15%. Payments are billed at end of month and received one month later. 10% retention money is required for the project. The value of work in progress is to be proportional to the time spent on it.

Month	1	2	3	4
Indirect + Direct Cost (\$)	\$67,000	\$21,500	\$19,600	\$42,300

- i. Draw the S-curve (6%)
- ii. Draw the cumulative value vs. time curve (6%)
- iii. Draw the cumulative income vs. time curve (6%)
- iv. Calculate the peak financial requirement (4%)

Note: Please draw all the curves in the same plot.