

1. (a) (i) Contract Administration procedures are important to avoid any misunderstandings amongst parties involved in the contract as well as a legal binding tool.

Two main categories of contracts are:

- Ad-measurement

- Cost Reimbursement

(ii) Contract risks are risks that comes with the contract agreement. For example, in a case of lump sum type of contract, the owner would bear very little contract risk and contractor will bear a high contract risk as any cost associated with the contract will affect contractor rather than owner.

Contract responsibility are the responsibilities of each parties involved in the contract.

e.g. * Owner responsible to remunerate contractor when works are finished.

* Contractor responsible to deliver work on time.

(b) (i) "Contract" is a way to communicate between two parties or more where they seek to make a legal binding agreement.

Nominated subcontractor are those subcontractor that the owner requires the main contractor to work with for a certain part of the project. So, instead of main contractor finds their own subcontractor to do a certain work, the owner would nominate.

This practice is usually done when the owner requires specific quality of work and think that it is best done by the said sub-contractor (nominated sub-con).

(ii) One of the possible outcomes:

- KSH won against Gurtnie
- Although KSH signed / acknowledged that they had ratified themselves with the nature of work and conditions on the ground, these information are obtained from Gurtnie. This is a case of ~~an~~ a misrepresentation from Gurtnie.

Note: During lecture, it is not emphasized what would be the correct answer. As long as your opinion is supported with logical explanation, it should be okay.

2.(c) (i) PE John is sitting inside a coffee shop when he overheard someone said that project XYZ is using a certain grade of steel. He then commented that a higher grade of steel should be used or else the project will be dangerous without first checking the facts about the project. This is not appropriate as he can be misleading the public and reduce public confidence in engineers.

(ii) PE John is currently serving the developer of a condominium project. The contractor for that project approaches PE John and offer S\$10,000 as a gesture of "goodwill". He should reject as receiving their money would make him feel indebted and cannot perform to the best of his ability to his employer.

(b) (i) · Work was suspended for more than 3 months without valid reason
 · Building works are not carried out in proper manner
 · Any of the key party ceased to function as one

(ii) · The engineer does not have any professional or financial interest of the buildings.

(c) (i) This is limited resource situation, a planner can either sourced for more resources or maximize the situation by adopting a current float method. The concept of this method is by laying out all activities and its required resources, then by prioritizing activities that are more critical (smaller value of float) we can proceed to the next step. These are repeated until the project is finished.

This method is used to minimize delays.

- (ii) An engineer could take note of all activities in progress and then, by extrapolating, estimate its completion time. He can then update this to the new CPM network with the new estimation of completion and probably new critical path.

3. (a) Cost Variance = Budgeted Cost - Actual Cost.

Budgeted Cost:

$$\begin{aligned}
 A \Rightarrow & 20,300 + 24,000 + 33,000 + 19,000 + \left(\frac{6}{25}\right) 42000 \\
 & + \left(\frac{18}{24}\right) (18400) + \left(\frac{15}{20}\right) (37500) \\
 = & 148,305.
 \end{aligned}$$

$$\begin{aligned}
 B \Rightarrow & 20,500 + 21,000 + 30,000 + 38,000 + \left(\frac{6}{25}\right) 35000 \\
 & + \left(\frac{18}{24}\right) (36800) + \left(\frac{15}{20}\right) (22500) \\
 = & 162,375
 \end{aligned}$$

$$\begin{aligned}
 C \Rightarrow & 20250 + 5000 + 15000 + 38500 + \left(\frac{6}{25}\right) (31000) \\
 & + \left(\frac{18}{24}\right) (36800) + \left(\frac{15}{20}\right) (8500) \\
 = & 120,165
 \end{aligned}$$

$$D \Rightarrow 45 \times 2500$$

$$= 1,12,500$$

Cost Variances:

$$A : 148,305 - 145,500 = 2805 \rightarrow 1.89\%$$

$$B : 162,375 - 148,000 = 14375 \rightarrow 8.85\%$$

$$C : 120,165 - 156,500 = -36335 \rightarrow -30.24\%$$

$$D : 112,500 - 130,500 = -18000 \rightarrow -16\%$$

(b) If there is no correction, the variation of the cost will follow the trend calculated in (a).

Expected cost after adjusting to variation:

$$A \Rightarrow 212,800 \times (100 - 1.89\%) = 208,778.1$$

$$B \Rightarrow 232,400 \times (100 - 8.85\%) = 211,893$$

$$C \Rightarrow 179,650 \times (100 - (-30.24\%)) = 233,976$$

$$D \Rightarrow 62 \times 2500 \times (100 - (-16\%)) = 179,800$$

600,645

Project value when marked up:

$$A \Rightarrow 212,800 \times 118\% = 383,040$$

$$B \Rightarrow 232,400 \times 118\% = 274,232$$

$$C \Rightarrow 179,650 \times 118\% = 211,987$$

$$D \Rightarrow 62 \times 2500 \times 118\% = 182,900$$

920,223

$$\text{Expected contribution} : 920,223 - 600,645$$

$$= 319,578$$

(c) Employing a cost centre allow us to revise and review which aspect of the project goes well or not financially.

By checking the variances of each cost centre, we can then take action on any part that doesn't goes well and/or revise our expectations on the project contribution.

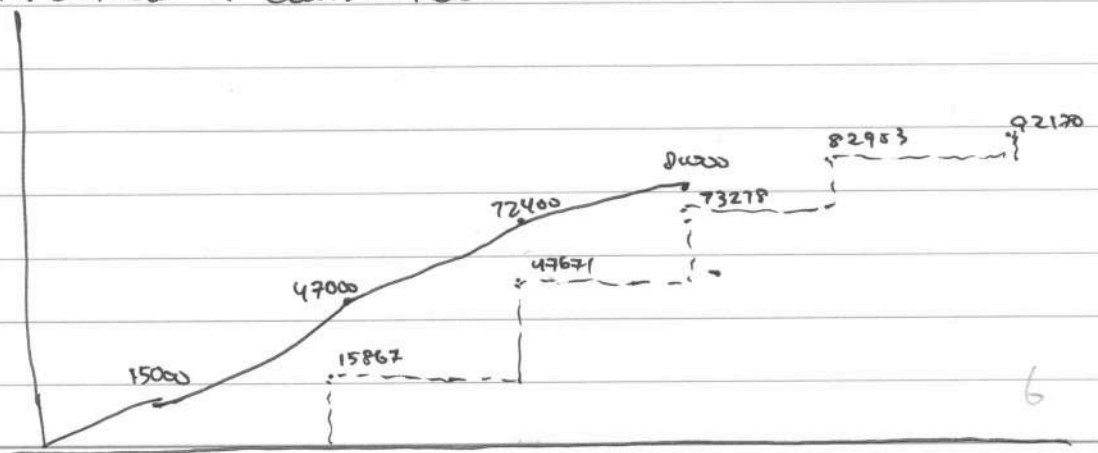
4. Critical path: 1-2-4-5-6

Schedule

Critical.	Duration	4	8	12	16	20	24
1-2	3	1200					
2-4	8	2200	8800	6600			
4-5	4			2200	6600		
5-6	1				2000		
Non crit.		-----					
2-3	4	2600	7800				
3-5	5		3400	13600			
2-5	6	3000	12000	9000			
(Critical)	Cost	9400	8800	8800	8600		
(Non-crit)	cost	5600	23200	16600			
(critical)	total cost	15000	47000	72400	81000		
(critical)	value	11750	11000	11000	10750		
(non-crit)	value	5880	24360	17430			
total	cum. value	17630	52990	81420	92170		
	cum. retention	1763	5299	8142	9217		
	cum. received	0	15867	47691	73278	82953	92170
	cum. outflow	0	15000	47000	72400	81000	
	cum. inflow	0	0	15867	47691	73278	82953

(a) Known as S-curve.

Plot cum. outflow & cum. inflow.



(b) Max. capital working required is determined from graph.
 Biggest gap \Rightarrow Working capital

From the S-curve in (a), we get:

$$72400 - 15867 = 56,533.$$

This happened at wk 12 right before the payment is received at the end of that week.

Gross profit expected: $92170 - 81000$
 $= 11170$ or about 13.8%.

