

ARUP

Job No.

Sheet No.

Rev.

Member/Location

Job Title

Drg. Ref.

C&amp;M 11/12 S1

Made by

Date

Chd.

1. (a)-(i)

Express terms

- clear stipulation in contract which parties intend binding upon them

Implied terms:

- Not mentioned by parties at times that they made contract but in mind
- the contract does not make commercial sense without that term; to give contract a sense of commercial efficacy.

(ii). The house should be inhabitable once completed. However, the wall suffered from weather penetration means that the workmanship was poor. It is an implied <sup>warranty</sup> ~~term~~ that a house should be inhabitable once completed & the builder agreed. Yet, he did not comply.

To resolve the dispute, the builder should recover the wall penetration and owner claim for warranty damages which is not repudiate the contract.

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15) (i) Two types of standard forms of contract used in Singapore.

- Lump sum contract

- Package deal contract

Advantages

- 1) work scope completely defined
- 2) no great risk & contractor under full control
- 3) Avoid detailed accounting & measuring work.

(ii) The contractor Y has breached the contract.

- This is because there is no terms say that cannot build due to increase of cost.
- The contractor only perform the work partially and create loss to the developer.

Compensation of loss & in damage will be only applicable to the land which belongs to developer X as he sold part of the land to contractor Y, which by law, the land ~~has~~ belongs to contractor Y and contractor Y can use it by any intention.

## Civil Engineering Management 11/12 S1

2. (a) i. For example, in a coffee shop, during a normal conversation session with others, a PE should not express the opinion on an engineering/construction project which he is not in charge. This is because by doing so, that PE is trying to supplant the other PE and criticize the work which he does not have any idea in. This is against the code of practice in PE Board.

Exception – unless that PE is being told that the other PE in the project is trying to do some engineering works that is against the code and he can only report to the PE Board with sufficient evidence.

ii. A PE shall not accept any commission or indirect payment for the engineering work which he is engaged in. He/She cannot accept the remuneration from the contractor for doing the engineering work under the same project. There will be a conflict of interest which will compromise the quality and safety of the construction works.

(b) i. Conditions which may trigger the revoke of a permit to carry out building work

- the building work which has not granted by the approval of CBC
- building works which is not conducted in proper manner
- works after commence but stop more than 3 months

ii. Independence of an engineer who is tasked to carry out the AC's role under the BC Act

- Registered and authorized by CBC
- Cannot have professional interest and financial interest in the engineering project

(c) It is not appropriate for a PE to participate in the commercial ads. According to the PE Act and Code of Professional Conduct and Ethics, PE is refrained from giving endorsement of the commercial ads. Furthermore, "I am a PE and I know P&B is the best automobile distributor in Singapore" is a phrase that convince the public by endorsing this commercial product by the name of PE. It is not appropriate to do so.

Contravention of PE code, and Professional conduct and ethics

- Name is cancelled and struck off from the PE Board for one year
- Penalty of less than \$10k will be imposed since it does not cause great danger or risk

(c)

- day to monitor
- work out the planned percentage complete based on the actual starting day
- determine the remaining days by using the percentage remaining from the actual percentage
- determine output rate
- corrective action to be taken to tackle any delay

4. (a) In order to search the optimum solution, the all normal activities should be crashed and get the crash solutions. It is called the shortening process of project duration.

- In the principles of crashing time, only critical activities considered for crashing
- If critical activity is crashed by 1 unit of time, there will be an increase in project direct cost and saving in indirect cost
- cost slope < indirect cost/time
- compression done in stages by considering the floats in Non-critical chains
- if two or more chains are critical, all critical chains must be compressed simultaneously by equal amounts

(b) Important aspects of financial planning and cost control

- for budgetary planning – income from projects, costs of projects, expenditure on overheads
- for control – cost incurred on site , expenditure on company overheads
- for cash flow forecasting – predicting the cash inflows and outflows, planning for working capital requirement

Adverse deviation of actual cost from planned cost – means actually it costs more in the project. Hence, more and more working capital needed to inject into the project.

And for the progress basis, the final profit will be decreased by the increasing indirect cost.

(c) i.

money received by owner = \$3214800  
Value of the work claim =  $\$3214800 / 0.9$   
= \$3572000  
Value of work not claim = \$252000  
Total value =  $\$252000 + \$3572000$   
= \$3824000

Total cost = direct cost + indirect cost

Direct cost = payment to sub-con = \$250000  
= material = \$1508000  
= labour = \$855200  
= on plant-hire = \$428600  
Indirect cost = site facilities = \$174800  
= site staff salaries = \$196200  
Total cost = \$3412800  
Mark-up percentage =  $(3824000 - 3412800) / 3412800 \times 100 \%$   
= 12.05%

ii.

contribution = Total value - total cost  
= \$3824000 - \$3412800  
= \$411200  
Profit = \$411200 - company overheads  
= \$411200 - \$185200  
= \$226000

3. (a) i.

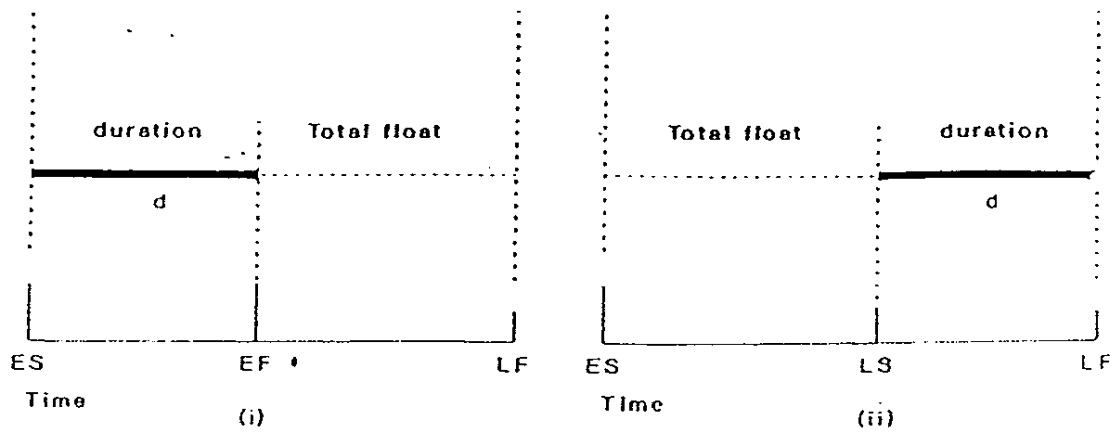
Earliest Event Time – earliest possible time which an event can occur

Latest event time – latest time y which an event must take place if the project duration is not be exceeded.

Total float – full amount of time by which the start of an activity may be delayed without extending the project duration

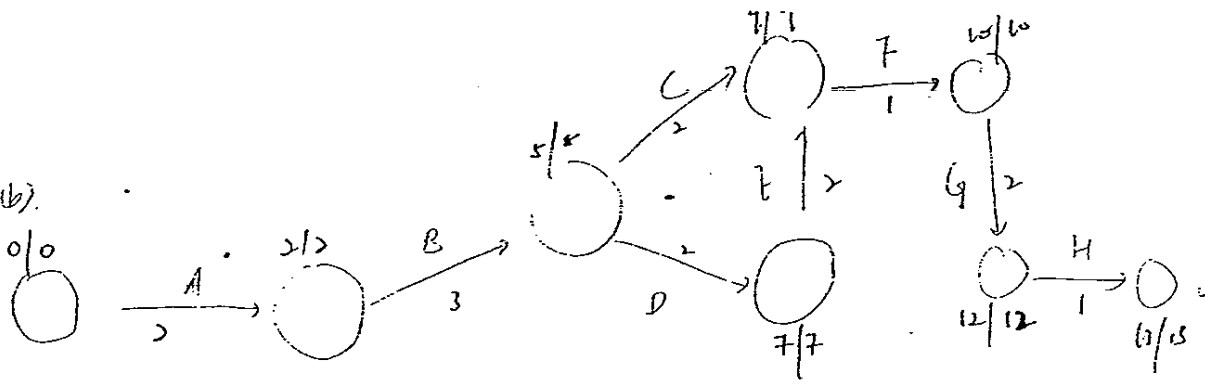
ii.

$$TF = LF - EF = LS - ES$$



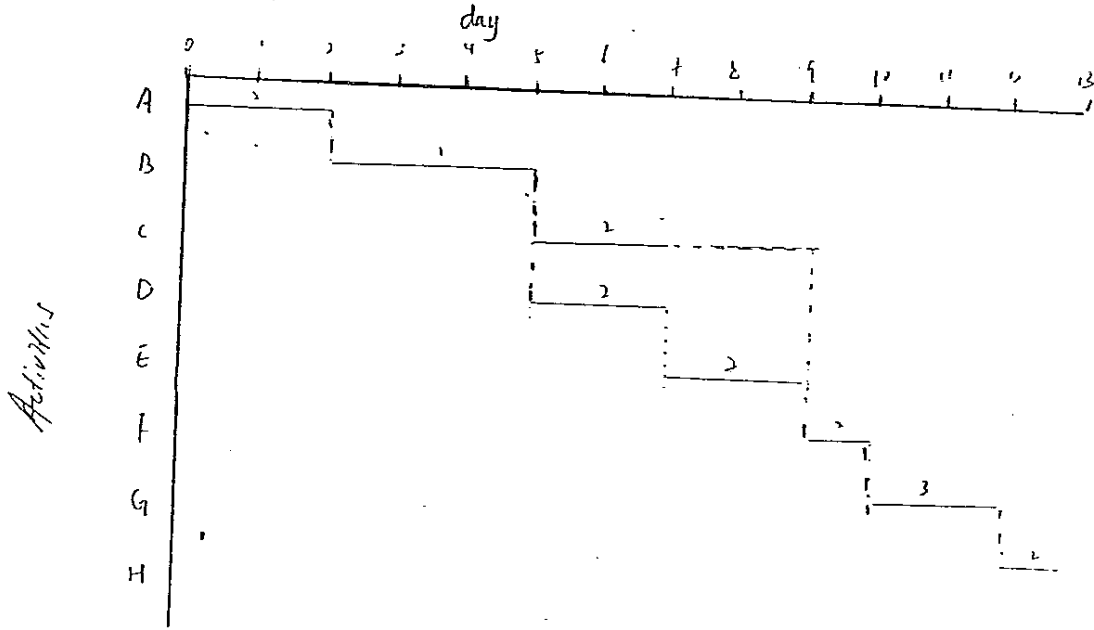
(b)

5. (b).



Critical path = A → B → D → E → F → G → H

Linked-Bar chart.



Histogram of manpower. (max manpower required = 4)

