

Sub: Construction Management & Entrepreneurship

Date: 06.03.2019

Duration:

90 mins

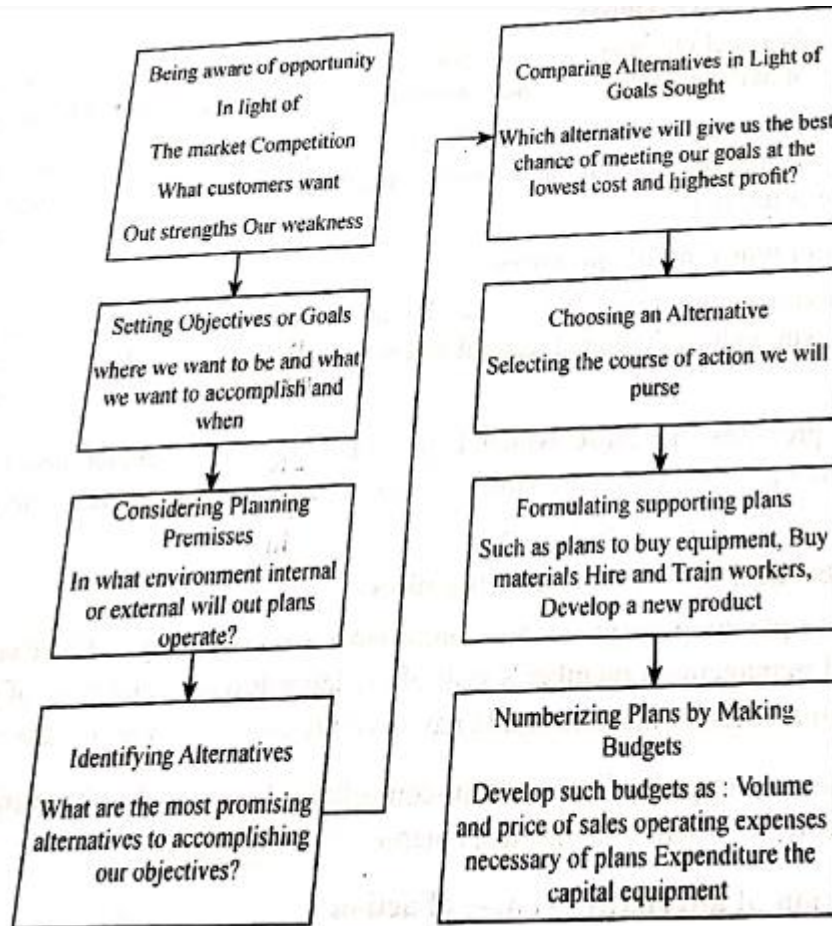
Max Marks:

50

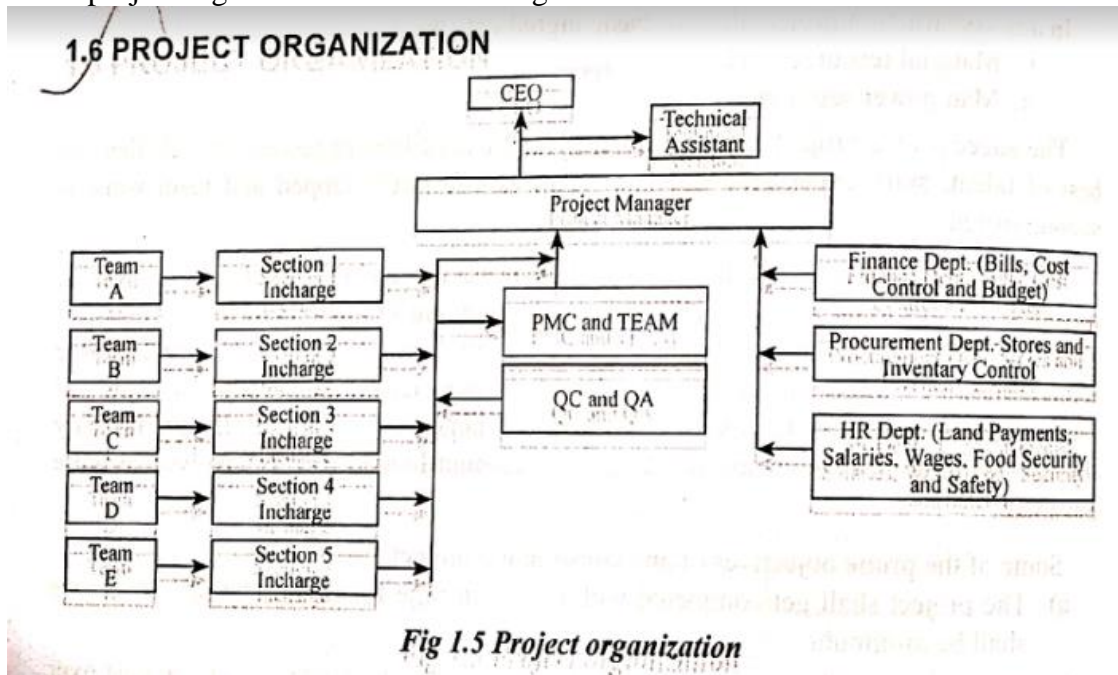
Sem:

VI

1 Based on your learning explain the steps that will be done in planning of a college building.



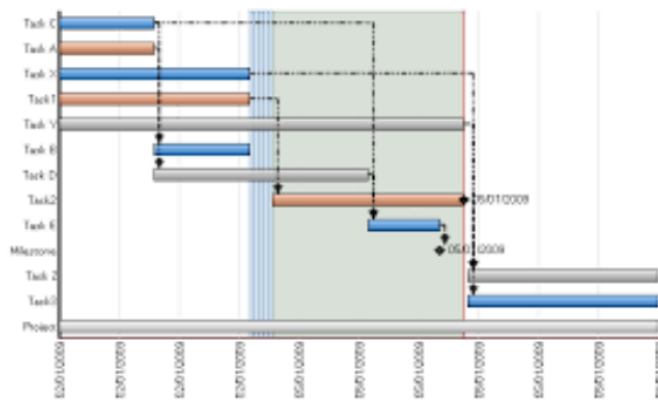
2 (a) Explain the project organization in detail. Using a flow chart.



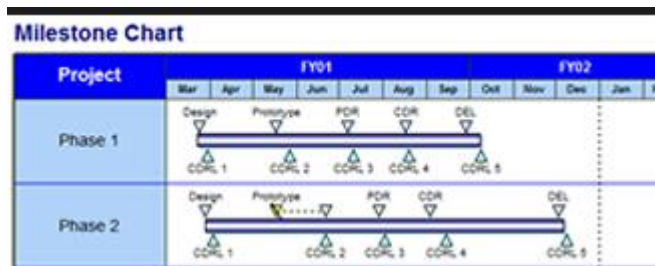
(b) Write the difference between Gantt chart & Milestone Chart

A Gantt chart is a tool used for project management. It is used to represent the timing of various tasks that are required to complete a project. A milestone chart is used to depict key events along a timescale graphically. Gantt chart may also be used to mark key events known as milestones and therefore in this context, the Gantt chart is also referred as a milestone chart.

Gantt Chart

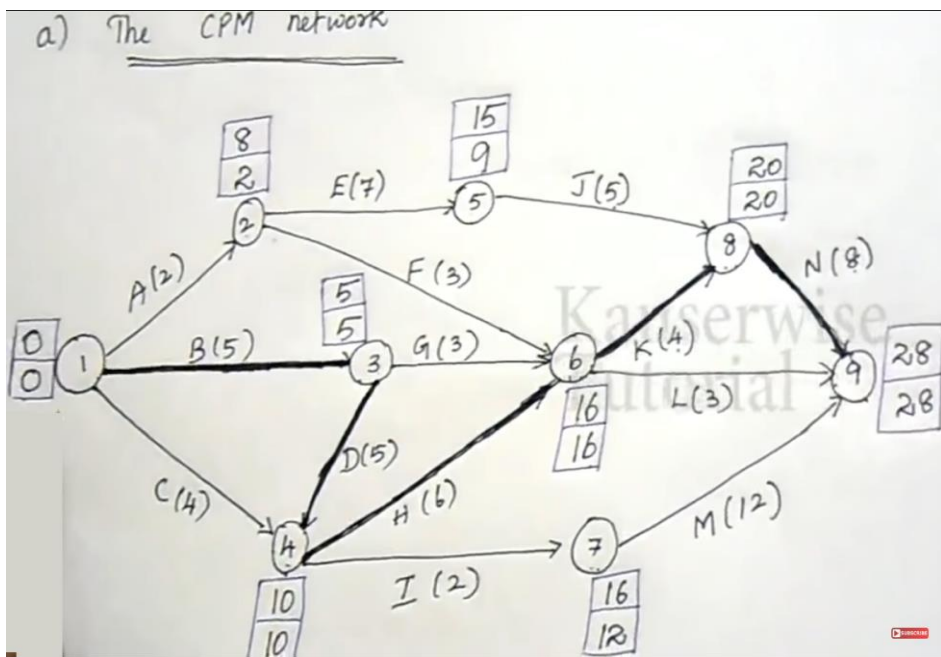
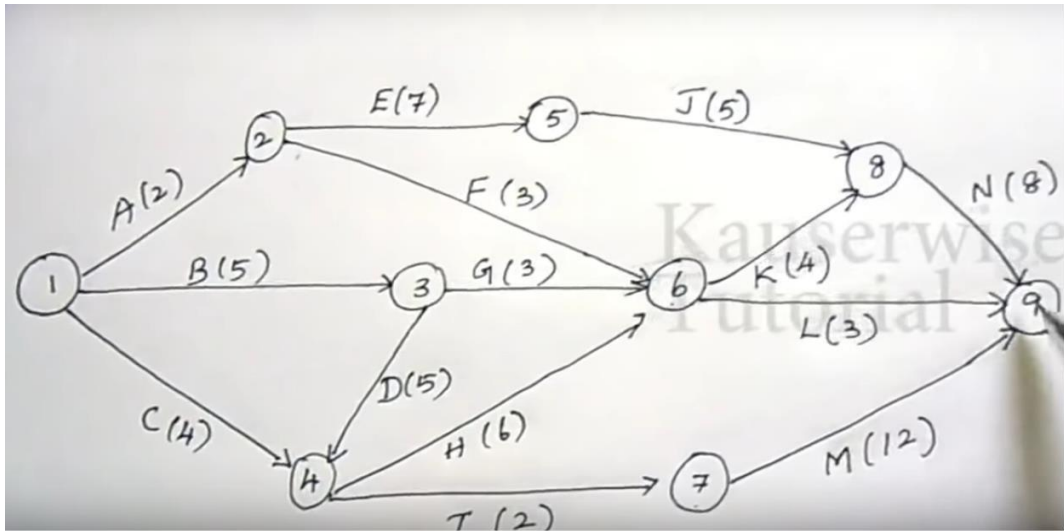


Milestone Chart



3 (a) Find the Critical path, total and free float for the following activities from A- N.

Task	Predecessor	Duration (Months)
A	--	2
B	--	5
C	--	4
D	B	5
E	A	7
F	A	3
G	B	3
H	C, D	6
I	C, D	2
J	E	5
K	F, G, H	4
L	F, G, H	3
M	I	12
N	J, K	8



Summary of Total Floats and Free Floats

Activity (i,j)	Duration (D _{ij})	Total float (TF _{ij})	Free floats (FF _{ij})
A 1-2	2	6	0
(B) 1-3	5	0 ✓	0 ✓
C 1-4	4	6	6
D 3-4	5	0	0
E 2-5	7	6	0

F 2-6	3	11	11
G 3-6	3	8	8
(H) 4-6	6	0 ✓	0 ✓
I 4-7	2	4	0
J 5-8	5	6	6
(K) 6-8	4	0 ✓	0 ✓
L 6-9	3	9	9
M 7-9	12	4	4
N 8-9	8	0	0

CP = B - H - K

4(a) Explain Workman Compensation Act and Contract Labour Act.

Workman Compensation Act, 1923

WORKMEN COMPENSATION ACT, 1923
The Workmen Compensation Act passed to protect the victims of accidents and their families from hardships out of and in the course of employment. The Act covers workmen employed in hazardous occupations as specified in the schedule but excludes those employed in clerical or administrative work. The Act provides for payment of compensation in case of accidents on work sites. The compensation, however, is not payable for injuries due to

- (i) Disobedience or negligence,
- (ii) Non observance of safety measures
- (iii) consumption of liquor
- (iv) diseases which are not contracted as a result of the occupation.

In the case of the death of a worker, compensation is paid under all circumstances.

Accidents are due to

- (i) Human causes such as poor eye sight, negligence, effect of intoxicants,
- (ii) Mechanical causes such as inadequate safety devices, live electrical equipment, unreliable scaffolding etc.
- (iii) Environmental causes. Such as poor lighting, heat, noise etc.

Contract Labour Act, 1970

The contract labour Act, 1970 was passed to regulate the employment of contract labour in certain establishments. It also provides for improving the service conditions of contract labour.

The Act is of importance to the construction industry where works are executed through contractors or by contract labour. The Act applies to every establishment and contractor employing twenty or more workmen. The Act does not apply to establishments in which only work of an intermittent or casual nature is performed.

The Act provides for the constitution of a Central Advisory Contract Labour Board under the Central Government and of state Advisory contract labour Board under each State Government to advise the Central and State Governments on matters arising out of the administration of the Act and to carry out the functions assigned to it under the Act.

The main provisions of the Act are:

- 1) **Registration of Establishments:** Every principal employer of an establishment to which the Act applies is required to make an application to the registering officer on the prescribed form for the registration of the establishment.
- 2) **Licensing of Contractors:** Every contractor executing any work through contract labour is required to obtain a license.
- 3) **Welfare and Health of Contract Labour:** Under the Act, the following facilities are required to be provided for the welfare and health of the contract labour:
 - (i) For works likely to continue for more than three months, where labour is required to halt at night in connection with the working of the establishment, the contractor should provide rest rooms. Separate rooms should be provided for women.
 - (ii) For works likely to continue for more than six months and employing more than 100 or more labour, an adequate canteen should be provided.
 - (iii) Latrines and urinals must be maintained in clean and sanitary conditions.
- 4) **Payment of wages:** Responsibility for the payment of wages rests upon the contractor.

Compare inventory management and inventory control

Inventory Management	Inventory Control
<p>Inventory Management software tracks and audits inventory and uses analytics to help determine the best ordering practices i.e. when and what stock to order.</p>	<p>Inventory Control software regulates stock that's already in a warehouse. It monitors the condition of existing stock and organizes the layout of the warehouse.</p>
<p style="text-align: center;">Features:</p> <ul style="list-style-type: none"> <li data-bbox="248 533 719 658">  Inventory control Tracks quantities of stock and optimizes processes for ordering inventory by using analytics and historical information. <li data-bbox="248 680 719 779">  Inventory auditing Supports inventory counts or stock-takes, including both physical and cycle counts. <li data-bbox="248 824 719 949">  Product categorization Tracks specific item attributes, such as size and color, to enable reporting on inventory levels. <li data-bbox="248 972 719 1093">  Barcoding/RFID Tracks inventory using barcode/radio frequency identification (RFID) functionality to scan items. <li data-bbox="248 1115 719 1236">  Order management Supports order capturing, processing, and fulfilment of orders from the point of purchase through payment and delivery. 	<p style="text-align: center;">Features:</p> <ul style="list-style-type: none"> <li data-bbox="831 533 1302 658">  Inventory tracking Tracks all products in inventory, by site, location, serial number, lot, date and/or pallet. <li data-bbox="831 680 1302 801">  Barcoding/RFID Tracks inventory using barcode/radio frequency identification (RFID) functionality to scan items. <li data-bbox="831 824 1302 949">  Check-in/Check-out Tracks items as they move through the warehouse to employees, vendors or customers, to prevent losses. <li data-bbox="831 972 1302 1093">  Automated alerts Provides alerts about low inventory levels, expiring items, overstocked items, and reorder points. <li data-bbox="831 1115 1302 1236">  Audits and reports Runs periodic audits of inventory and generates reports to track stock and recognize problems before they develop.

5(a)

An excavator with a 3 CY bucket is being considered for use on a project to excavate sandy clay with a swell factor of 20% from a borrow pit. The clay will be loaded in to trucks having a loading height of 10 ft. The average cycle time for the excavator to load bucket, swing, dump, and return is 20 seconds. The efficiency factor is equal to a 55-min hour? What is the estimated production of the excavator in BCY?

Step 1. Size of bucket, 3cy

Step 2: Bucket fill factor (Table 9.4), hard clay 80 to 90%; use average 80% = 0.80

Step 3. Typical cycle element times: 20 sec

Step 4: Efficiency Factor: 55 min/hour = 55/ 60

Step 5: Class of Material, hard clay, swell 20% = 0.20

Step 6: Excavator Production = $((3600\text{s/hr} * 3\text{cy} * 0.80) / (20\text{s/cycle}) * (55\text{min}/60\text{min}) * (1 / (1 + 0.35))) = 330$ bcy/hr.

6 Explain in detail about the ownership costs in owning an equipment.

Ownership Costs

(i) Purchase Price

The typical price for a new machine in the 40-ton category prices ranges from around Rs. 30000,000 to Rs. 45000,000. Remember that this is the suggested list price. Consult a dealer for an actual quote. The value of a trade-in machine or a package deal involving additional machines may have an impact as well. You may want to compare the purchase price against buying a low-hour used machine or a refurbished machine. "The normal refurbishment cost can be somewhere between 30 to 45 percent of the price of a new machine," Pressley says. And while most people tend to focus on the purchase price, it is always a small part of the total O&O costs.

(ii) Finance/Interest Cost

The average APR is around 6 percent for this size machine.

(iii) Insurance

Depending on your provider, expect to pay about 2 percent of the purchase price on an annual basis.

(iv) Resale Price/Residual Value

The reputation of the brand, number of hours on the engine and major components, condition of the machine, quality of maintenance and local market dynamics all play a role in setting the resale price. In general, artics in the 40-ton category lose somewhere in the range of 10 to 15 percent of their residual value per year, says Pressley.

(b) Write in detail about any 2 Excavation Equipment

Excavation Equipment are:

- ▶ Power shovel
- ▶ Back hoe
- ▶ Drag line
- ▶ Clam shell
- ▶ Scrapers
- ▶ Bull dozer

Power Shovel

- ▶ To excavate the earth and to load the trucks
- ▶ capable of excavating all types of earth except hard rock
- ▶ size varies from 0.375m³ to 5m³ .
- ▶ Basics parts of power shovel are

Applications

- ▶ Suitable for close range of work
- ▶ Capable of digging very hard materials,
- ▶ can remove big sized boulders.
- ▶ It is used in various types of jobs such as digging in gravel banks, clay pits, digging cuts in road works, road-side berms, etc.

Factors affecting output of power shovel

- ▶ Class of material
- ▶ Depth of cutting
- ▶ Angle of swing (The number of degrees through which the dipper or shovel bucket moves horizontally from the filled position to the dumping position.)
- ▶ Job condition
- ▶ Management condition
- ▶ Size of hauling units
- ▶ Skill of the operator
- ▶ Physical condition of the shovel

Back Hoe

- ▶ Also known as hoe, back shovel and pull shovel.
- ▶ It is used to excavate below the natural surface on which it rests.
- ▶ Generally used to excavate trenches, pits for basements and also for grading works, which requires precise control of depths.
- ▶ The basic parts are boom, Jack boom, Boom foot drum, Boom sheave, Stick sheave, Stick, Bucket and Bucket sheave

Application

- ▶ It is the most suitable machine for digging below the machine level, such as, trenches, footings, basements etc.
- ▶ It can be efficiently used to dress or trim the surface avoiding the use of manual effort for dressing the excavated surface.

Dragline

- ▶ The drag line is so name because of its prominent operation of dragging the bucket against the material to be dug.
- ▶ Unlike the shovel, it has a long light crane boom and the bucket is loosely attached to the boom through cables.

- ▶ Because of this construction, a dragline can dig and dump over larger distances than a shovel can do.
- ▶ Drag lines are useful for digging below its track level and handling softer materials.
- ▶ The basic parts of a drag line including the boom, hoist cable, drag cable, hoist chain, drag chain and bucket.

Applications

- ▶ It is the most suitable machine for dragging softer material and below its track level
- ▶ It is very useful for excavating trenches when the sides are permitted to establish their angle of repose without shoring.
- ▶ It has long reaches.
- ▶ It is mostly used in the excavation for canals and depositing on the embankment without hauling units.

Clam Shell

- ▶ This is so named due to resemblance of its bucket to a clam which is like a shell-fish with hinged double shell.
- ▶ The front end is essentially a crane boom with a specially designed bucket loosely attached at the end through cables as in a drag line.
- ▶ The capacity of a clam shell bucket is usually given in cubic meters.
- ▶ The basic parts of clam shell bucket are the closing line, hoist line, sheaves, brackets, tagline, shell and hinge.

Applications

- ▶ Used for handling loose material such as crushed stone, sand, gravel, coal etc.
- ▶ Main feature is vertical lifting of material from one location to another.
- ▶ Mainly used for removing material from coffer dam, sewer main holes, well foundations etc.