



**SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR**  
Siddharth Nagar, Narayanavanam Road – 517583

**QUESTION BANK**

**Subject with Code: CONSTRUCTION PROJECT MANAGEMENT(CPM) (16CE2016)**

**Course & Branch: M. Tech - Structural Engineering**

**Year & Sem: I M.TECH & II-Sem**

**Regulation: R16**

**UNIT-I**  
**CONCEPT OF A PROJECT**

1. Discuss characteristics of construction management.
2. Give detailed account on various phases of construction management.
3. (a) What are various socioeconomic risks that effects organization during course of project implementation  
(b) With a neat sketch explain matrix and project oriented organizations
4. Outline various project risks that effects an organization
5. (a) What is the sequence of steps in traditional designer projects?
6. Write notes on:
  - a. Owner – Builder Operations
  - b. Turnkey – Operations
7. What is the perception of owner and contractor on construction projects?
8. How interpersonal behaviour plays a role in success of construction projects.
9. What is role of leadership and motivation in construction projects?
10. Write short notes on the following:
  - a. Project life cycle
  - b. Professional construction management

**UNIT-II**  
**QUALITY AND SAFETY CONCERNS IN CONSTRUCTION**

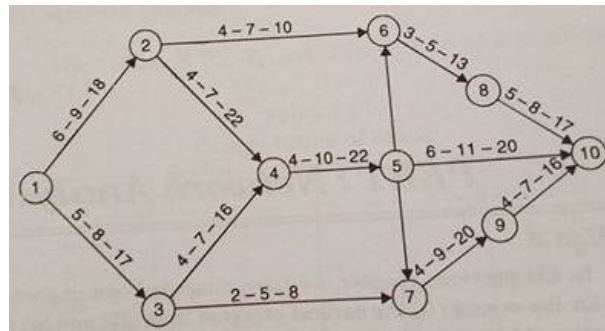
1. How quality and safety is organized in construction industry.
2. With a suitable example explain how work and material specifications are implemented.
3. Write a detailed note on total quality control
4. Explain how statistical methods are employed in achieving quality control.
5. What is statistical quality control with sampling by attributes?
6. How statistical quality control with sampling by variables in accomplished.
7. Write a detailed note on construction safety
8. The yield stress of a random sample of 25 pieces of steel was measured, yielding a mean of 52,800 psi. and an estimated standard deviation of  $s = 4,600$  psi.
  - a. What is the probability that the population mean is less than 50,000 psi?
  - b. What is the estimated fraction of pieces with yield strength less than 50,000 psi?

- c. Is this sampling procedure sampling-by-attributes or sampling-by-variable?
9. Suppose that a contract specifies a sampling-by-attributes plan in which ten samples are taken at random from a large lot ( $N=100$ ) and at most one sample is allowed to be defective for the lot to be acceptable.
- If the actual percentage defective is five percent, what is the probability of lot acceptance? (Note: you may use relevant approximations in this calculation).
  - What is the consumer's risk if an acceptable quality level is fifteen percent defective and the actual fraction defective is 0.05?
  - What is the producer's risk with this sampling plan and a 8% defective percentage?
10. In a random sample of 40 blocks chosen from a production line, the mean length was 10.63 inches and the estimated standard deviation was 0.4 inch. Between what lengths can it be said that 98% of block lengths will lie?

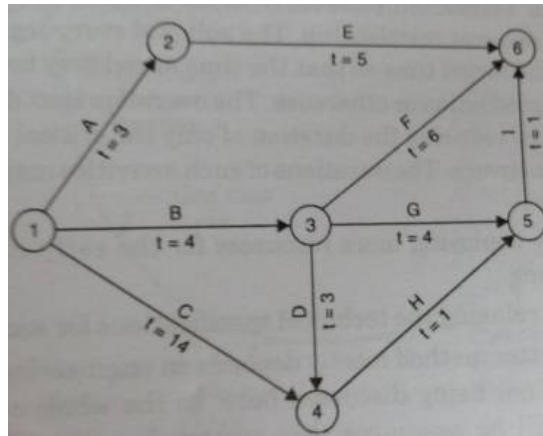
### UNIT-III

### NETWORK TECHNIQUES

1. The network for a construction project is shown in Figure. The three time estimates for each activity are given along each activity arrow. Compute (a) expected time of completion of each activity, (b) earliest expected time for each event, (c) latest allowable occurrence time for each event.



2. The network shown in Figure has the estimated duration for each activity marked. Determine the total float for each activity and establish critical path. Also determine free float and independent float for each activity.



3. What are the shortcomings of bar charts? How are these removed?
4. What is a milestone chart? How does it differ from a bar chart? How can milestone chart be developed into network?
5. A project consists of 8 activities A, B, C, D, E, F, G and H with their times of completion as follows:

Activates	A	B	C	D	E	F	G	H
Durations (weeks)	2	4	2	4	6	4	5	4

The precedence relationships are as follows:

A & B can be performed in parallel

C & D cannot start until A is complete

E cannot start until half the work of activities C is complete

F can start only after activity D is complete

G succeeds C

H is the last activity, which should succeed E

- (a) Draw the bar chart
  - (b) What is the total time of completion of the project?
6. The time estimates for three activities A, B and C are as follows:

	Optimistic time	Most likely time	Pessimistic time
<b>A</b>	10	12	14
<b>B</b>	6	8	12
<b>C</b>	5	10	12

Determine expected time and variance for each activity. Which activity has more reliable time estimates?

7. A construction project consists of 12 activities. The predecessor relationships are identified by their node numbers as indicated below:

Activity	Identification
A	1,2
B	2,4
C	2,3
D	2,7
E	3,4
F	3,5
G	4,6
H	5,6
I	5,7
J	7,8
K	6,8
L	8,9

Draw the network diagram.

8. Table below gives the data about durations and costs of various activities of the project.

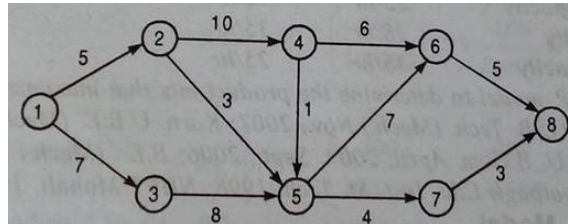
Activity	Normal Duration (weeks)	Normal Cost ( ₹ )	Crash duration (weeks)	Crash Cost ( ₹ )
1-2	4	4000	2	12000
2-3	5	3000	2	7500
2-4	7	3600	5	6000
3-4	4	5000	2	10000

The project overhead costs are . 2000 per week. Find the optimum duration and the cost associated with it. Also draw the least cost network.

9. What do you understand by updating? Why is it essential? Illustrate the method of updating with a suitable example.
10. Distinguish the following:
1. Bar chart and Mile stone chart
  2. CPM and PERT

**UNIT-IV**  
**OPTIMIZATION TECHNIQUES**

1. With the help of an illustrative example, explain the resources smoothing method.
2. Given below is a network in which the figures written against the arrows indicate the time of completion in days from the preceding to the following node.



Formulate the linear programming model to find the least cost route from node 1 to node 8.

3. Use simplex method to solve the following problem:

$$\text{Maximize } Z = 2x_1 + 5x_2$$

$$\text{Subject to } \begin{aligned} x_1 + x_2 &\leq 24, \\ 3x_1 + x_2 &\leq 21, \\ x_1 + x_2 &\leq 9, \\ x_1, x_2 &\geq 0 \end{aligned}$$

4. Using graphical method find the maximum value of

$$Z = 2x_1 + 3x_2$$

$$\text{Subject to } x_1 + x_2 \leq 30$$

$$x_2 \geq 3$$

$$x_2 \leq 12$$

$$x_1 - x_2 \geq 0$$

$$0 \leq x_1 \leq 20$$

5. Write a detailed note on various modes of material transportation.
6. Describe with a flow diagram the steps required for material management of a construction firm.
7. Explain how equipment is managed in a construction firm.
8. Write a detailed note on inventory control.
9. A construction company purchases 10,000 bags of cement annually. Each bag of cement costs Rs.200/- and the cost incurred in purchasing each lot is Rs.100/- The cost of carrying is 25%. What is the most economic order quantity? What is the average inventory level?
10. A shop dealing in construction goods has 7 different items in its inventory. The average number of units of each of these items held in the store along with their unit cost is given in table below. The shopkeeper as decided to employ ABC inventory system. Classify the items in A, B and C categories.

Item	Average number of units	Average cost per unit in inventory (Rs.)
1	10,000	121.50

2	10,000	100.00
3	24,000	14.50
4	16,000	19.75
5	60,000	3.10
6	50,000	2.45
7	30,000	0.50

**UNIT-V**  
**COST CONTROL PROBLEM**

1. What is a project budget? Show a typical project budget.
2. With a suitable example how activity cost control is forecasted.
3. Explain how financial accounting systems and cost accounts are maintained in construction projects.
4. Explain how project schedule is controlled with a suitable illustration.
5. Explain how cash flow control is exercised in construction projects.
6. Draw a typical graph for actual and budget expenditure. Explain how the graph is useful.
7. Write a detailed note on scheduled control.
8. With a suitable example explain how schedule and budget updates are performed.
9. Explain how cost and schedule information is related.
10. Present a typical project budget for a design office.

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