

## B.Tech 8th Semester Exam., 2019

CONSTRUCTION PLANNING AND  
MANAGEMENT

Time : 3 hours

Full Marks : 70

Instructions :

- (i) The marks are indicated in the right-hand margin.
- (ii) There are **NINE** questions in this paper.
- (iii) Attempt **FIVE** questions in all.
- (iv) Question No. 1 is compulsory.

1. Choose the correct answer of the following  
(any seven) : 2×7=14

- (a) Which of the following does not represent an activity?
  - ~~(i)~~ Site located
  - (ii) Foundation is being dug
  - (iii) The office area is being cleaned
  - (iv) The invitations are being sent

- (b) Sensitivity analysis is a study of
  - (i) comparison of profit and loss
  - (ii) comparison of assets and liabilities
  - ~~(iii)~~ change in output due to change in input
  - (iv) economies of cost and benefits of the project
- (c) Preliminary project report for a road project must contain
  - (i) the detailed estimated cost based on detailed design
  - (ii) the several alternatives of the project that have been considered
  - ~~(iii)~~ the soil survey, traffic survey, concept design and approximate cost
  - (iv) the contract documents for inviting tenders
- (d) Updating may result in
  - (i) change of critical path
  - (ii) decrease of project completion time
  - (iii) increase of project completion time
  - ~~(iv)~~ All of the above

- (b) Critical path method
- is an improvement upon bar chart method
  - provides a realistic approach to daily problems
  - avoids delays which are very common in bar charts
  - All of the above
- (f) In the time-cost optimization, using CPM method for network analysis, the crashing of the activities along the critical path is done starting with the activity having
- longest duration
  - highest cost slope
  - least cost slope
  - shortest duration
- (g) Interfering float is the difference between
- total float and free float
  - total float and independent float
  - free float and independent float
  - None of the above

- (h) PERT technique of network analysis is mainly useful for
- small projects
  - large and complex projects
  - research and development projects
  - deterministic activities
- (i) For completion of a project, the critical path of the network represents
- minimum time
  - maximum time
  - maximum cost
  - minimum cost
- (j) Which one of the following represents an event?
- Concrete cured
  - Fixing of door
  - Plastering of walls
  - Selecting sites

2. (a) What are the types of pre-fabricates based on (i) plan area and (ii) weight? 7
- (b) What is the need of pre-fabricates structures? 7
3. (a) Compare and contrast CPM and PERT. Under what circumstances would you use PERT as opposed to CPM in project management? 7
- (b) Discuss the objectives of network analysis. 7

4. The following table gives the data for the duration and costs of each activity of the project network. The indirect cost of the project is ₹ 11.5 lakh per week. Determine the optimum duration and minimum duration of project and corresponding cost. Draw the time-scaled version of the crashed network : 14

Activity Crash Cost	Normal Duration (weeks)	Normal Cost (lakh)	Crash Duration (weeks)	Crash Cost (lakh)
1-2	6	40	3	70
1-3	5	30	3	52
2-4	2	60	1	84
3-4	10	70	6	98
2-5	3	45	2	63
4-5	4	26	2	50

5. A company manufactures two products  $X_1$  and  $X_2$  on three machines A, B and C.  $X_1$  requires 1 hour on machine A and 1 hour on machine B and yields a revenue of ₹ 3. Product  $X_2$  requires 2 hours on machine A and 1 hour on machine B and 1 hour on machine C and yields revenue of ₹ 5. In the coming planning period, the available time of three machines A, B and C are 2000 hours, 1500 hours and 600 hours respectively. Find the optimal product mix using linear programming. 14
6. (a) List the various safety measures you suggest for a multi-storied construction work. 7
- (b) What do you understand by 'work breakdown structure' in construction planning? Draw the work breakdown structure for construction of two-storied hostel building. 7
7. (a) Derive graphically relationship between optimum duration time and optimum cost. 7
- (b) What do you mean by updating? How and when is it done? 7

8. (a) Discuss the methods of project monitoring. 7
- (b) What are the objectives of resource allocation? Explain what you mean by resource levelling. Explain step-by-step process for resource levelling. 7
9. (a) Explain the concept of value and define value analysis. Write in detail the steps in value analysis. 7
- (b) Define and explain the following : 7
- (i) Pessimistic time
  - (ii) Optimistic time
  - (iii) Most probable time

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