

COURSE CODE (CREDITS): 18B1WCE531 (3)

MAX. MARKS: 35

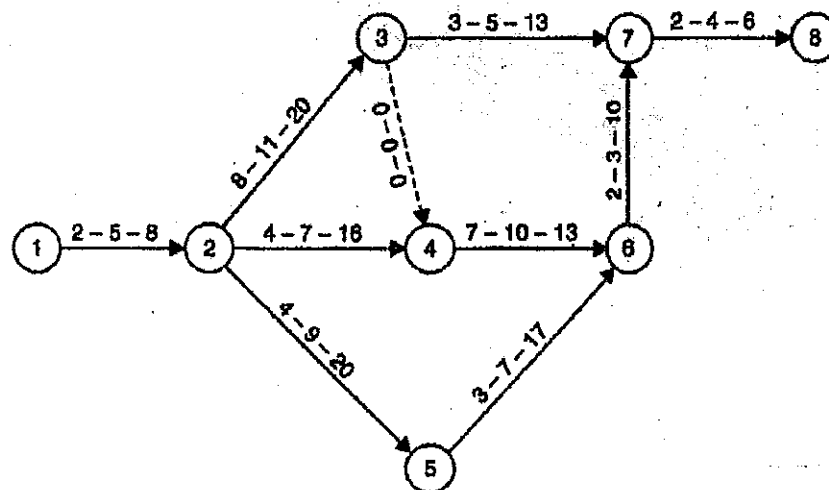
COURSE NAME: Construction Technology and Management

COURSE INSTRUCTORS: KAUSHAL KUMAR

MAX. TIME: 2 Hours

**Note:** (a) All questions are compulsory. (b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

- Q1. Explain the differences between CPM and PERT networks. **CO-1,2,3 [2 Marks]**
- Q2. Discuss various rules for providing dummies in a network. What are redundant dummies? **CO-1,2 [2 Marks]**
- Q3. Differentiate between Resource Smoothing and Resource Leveling. **CO-4 [3 Marks]**
- Q4. Figure below shows the network for a construction project, with the three time estimates of each activity marked. Determine: **CO-2 [5 Marks]**
- Critical path and its standard deviation.
  - Probability of completion of project in 40 days.
  - Time duration that will provide 95% probability of its completion in time.



Normal Variate (Z)	1.0	1.5	2.0	2.5	3.0
Probability (%)	84.13	93.32	97.72	99.38	99.87

- Q5. For the given activities mentioned in the table below.

Activity	Normal duration (weeks)	Normal cost (Rs.)	Crash duration (weeks)	Crash cost (Rs.)
1—2	6	7000	3	14500
1—3	8	4000	5	8500
2—3	4	6000	1	9000
2—4	5	8000	3	15000
3—4	5	5000	3	11000

The indirect cost of the project is Rs. 3000 per week. Determine the optimum duration of the project and the corresponding minimum cost. Draw the time scaled version of the network at each stage of crashing.

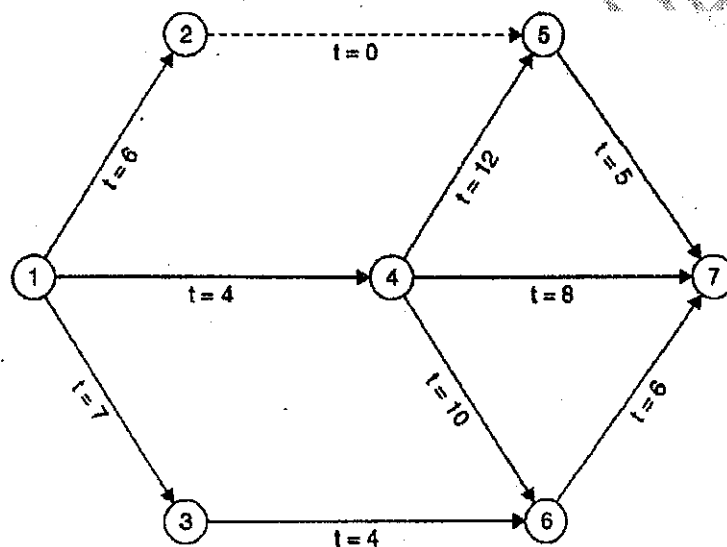
**CO-3,4 [5 Marks]**

Q6. A network for a project is shown in the figure below. The network is to be updated after 10 days of its execution. The following conditions exist at the end of 10 days :

- (a) Activity 1-2, 1-3 and 1-4 have been completed as originally scheduled.
- (b) Activity 4-5 is in progress and will require 6 more days for its completion.
- (c) Activity 4-6 is in progress and will require 6 more days for its completion.
- (d) Activity 3-6 is in progress and will be completed in one day.
- (e) Other activities have not been commenced and their original predicted durations will hold good, except for activity 5-7 which will require only three days instead of 5 days originally planned.

Update the network and determine the critical path of the updated network. What is the total increase in the project duration?

**CO-2,4 [3 Marks]**



Q7. Explain any one among tilting type of mixers and pan type of mixers used in concrete mixing with the help of neat sketch.

**CO-5 [3 marks]**

Q8. What is grouting? Define categories of grout. Explain in detail the grouting method used for stabilizing the soil in tunneling.

**CO-5,6 [4 marks]**

Q9. Describe by means of a simple diagram and name the main parts. Also indicate its suitability in field operations. (Answer any one)

**CO-5,6 [5 marks]**

- a) Bulldozer
- b) Derrick Crane
- c) Power Shovel

Q10. What are the different compacting equipments used at construction sites? Explain any one in detail.

**CO-5,6 [3 marks]**