Course Code: 19CE0147 **R19**

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR (AUTONOMOUS)
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code: PROJECT PLANNING AND CONTROL (19CE0147) **Course & Branch**: ECE & ME

Year & Sem: III Year & II Sem **Regulation:** R19

UNIT –I
PROJECT MANAGEMENT, BASIC TECHNQUES OF PROJECT MANAGEMENT

<table>
<tr><td>1</td><td>a. Discuss in brief the role of management in project execution.
b. Write down different objectives involved in project management ?</td><td>[L1][CO1]
[L2][CO1]</td><td>[6M]
[6M]</td></tr>
<tr><td>2</td><td>Describe various phases involved in project management and also Explain it in brief?</td><td>[L2][CO1]</td><td>[12M]</td></tr>
<tr><td>3</td><td>a.What is the role of Decision making in project Management. Explain?
b. Explain about project life cycle?</td><td>[L2][CO1]
[L2][CO1]</td><td>[6M]
[6M]</td></tr>
<tr><td>4</td><td>a. Explain why planning is necessary in project management.
b. Describe various steps for planning a project.</td><td>[L1][CO1]
[L1][CO1]</td><td>[6M]
[6M]</td></tr>
<tr><td>5</td><td>a. What is the use of bar chart? Write down steps for the construction of a bar chart with sketch .
b. Write down various Limitations to construct a bar chart?</td><td>[L1][CO1]
[L1][CO1]</td><td>[6M]
[6M]</td></tr>
<tr><td>6</td><td>What are the types of Network systems? Explain briefly.</td><td>[L1][CO1]</td><td>[12M]</td></tr>
<tr><td>7</td><td>a) Write down the Difference between CPM and PERT networks?
b) List out the advantages of network over milestone charts?</td><td>[L1][CO2]
[L1][CO2]</td><td>[6M]
[6M]</td></tr>
<tr><td>8</td><td>Draw the bar chart for finalization of designs and work order for a building project.
<table>
<tr><th>Activity</th><th>Description</th><th>Time for completion(weeks)</th></tr>
<tr><td>A</td><td>Site selection &survey</td><td>4</td></tr>
<tr><td>B</td><td>Design</td><td>6</td></tr>
<tr><td>C</td><td>Preparation of Drawings</td><td>3</td></tr>
<tr><td>D</td><td>Preparation of specifications &tender documents</td><td>2</td></tr>
<tr><td>E</td><td>Tendering(NIT)</td><td>4</td></tr>
<tr><td>F</td><td>Selection of Contractor</td><td>1</td></tr>
<tr><td>G</td><td>Award of work order</td><td>1</td></tr>
</table></td><td>[L3][CO1]</td><td>[12M]</td></tr>
<tr><td>9</td><td>The Activity Breakdown for a certain project is as under.
<table>
<tr><td>Activity</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr>
<tr><td>Duration(weeks)</td><td>1</td><td>2</td><td>4</td><td>3</td><td>1</td><td>2</td><td>4</td></tr>
</table>
Activity 2&3 can be done concurrently and both must follow activity 1.Activity 2 must precede activity 4.activity 5 can not begin until both activities 2&3 are complete. Activity 6 can be started only after activities 4&5 complete. Activity 7 is the last activity which can be started only after completion of activity 5.Prepare the bar chart.</td><td>[L2][CO2]</td><td>[12M]</td></tr>
<tr><td>10</td><td>A project consist of 8 activities A,B,C,D,E,F,G and H with their times of completion as follows
<table>
<tr><td>Activity</td><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td><td>F</td><td>G</td><td>H</td></tr>
<tr><td>Duration(weeks)</td><td>2</td><td>4</td><td>2</td><td>4</td><td>6</td><td>4</td><td>5</td><td>4</td></tr>
</table>
The precedence relationships are as follows
A and B can be performed in parallel. C and D cannot start until A is complete. E cannot start until half the work of activity C is complete. F can start only after activity D is complete. G succeeds C. H is the last activity which should succeed E.</td><td>[L3][CO1]</td><td>[12M]</td></tr>
</table>

	a. Draw the bar chart. b. What is the total time of completion of the project. c. If there is increase of 2 weeks in time of completion of activity A, What will be the corresponding increase in the total time of the completion of the project.		

Course Code: 19CE0147 **R19**

UNIT –II
ELEMENTS OF NETWORK AND DEVELOPMENT OF NETWORK

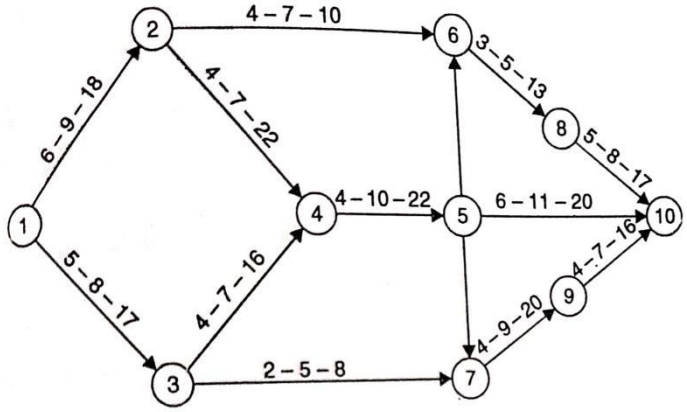
<table>
<tr><td rowspan="2">1</td><td>a</td><td>Define and give examples of event. How it represents?</td><td>[L1][CO2]</td><td>[6M]</td></tr>
<tr><td>b</td><td>Define and give examples of activity. How it represents?</td><td>[L1][CO2]</td><td>[6M]</td></tr>
<tr><td rowspan="2">2</td><td>a</td><td>Define dummy. What are uses of dummies?</td><td>[L1][CO2]</td><td>[6M]</td></tr>
<tr><td>b</td><td>Explain the rules for provision of dummies?</td><td>[L1][CO2]</td><td>[6M]</td></tr>
<tr><td rowspan="2">3</td><td>a</td><td>Explain about network rules and cycles.</td><td>[L1][CO2]</td><td>[6M]</td></tr>
<tr><td>b</td><td>Explain about network graphical guide lines for network</td><td>[L1][CO2]</td><td>[6M]</td></tr>
<tr><td rowspan="2">4</td><td>a</td><td>What are common practical situation in network and how it represents?</td><td>[L1][CO2]</td><td>[6M]</td></tr>
<tr><td>b</td><td>Explain how will you give numbering the events?</td><td>[L1][CO2]</td><td>[6M]</td></tr>
<tr><td rowspan="2">5</td><td>a</td><td>Write about categories in inter-relationship between activities.</td><td>[L1][CO2]</td><td>[6M]</td></tr>
<tr><td>b</td><td>Draw a network diagram for the project having 7 activities with the following interrelationships:
i. C follows D but precedes F.
ii. C follows B but precedes H.
iii. G follows F but precedes I.
iv. E follows A but precedes I.
v. D follows A.
vi. H and I terminate at the same time.
vii. A and B starts at the same time.</td><td>[L3][CO2]</td><td>[6M]</td></tr>
<tr><td rowspan="2">6</td><td>a</td><td>Project plan consisting of ten events have predecessor relationships as under:
<table>
<tr><th>Event</th><th>Immediate predecessor</th><th>Event</th><th>Immediate predecessor</th></tr>
<tr><td>1</td><td>-</td><td>6</td><td>3,5</td></tr>
<tr><td>2</td><td>1</td><td>7</td><td>3,4</td></tr>
<tr><td>3</td><td>2</td><td>8</td><td>3,7</td></tr>
<tr><td>4</td><td>2</td><td>9</td><td>7</td></tr>
<tr><td>5</td><td>2</td><td>10</td><td>3,6,8,9</td></tr>
</table>
Draw the network diagram for the project.</td><td>[L3][CO2]</td><td>[6M]</td></tr>
<tr><td>b</td><td>The maintenance of project of a building consists of ten jobs. The predecessor relationships are identified by their node numbers, as indicated below:
<table>
<tr><th>Job</th><th>Identification</th><th>Job</th><th>Identification</th></tr>
<tr><td>A</td><td>(1,2)</td><td>F</td><td>(4,5)</td></tr>
<tr><td>B</td><td>(2,3)</td><td>G</td><td>(4,7)</td></tr>
<tr><td>C</td><td>(2,4)</td><td>H</td><td>(5,8)</td></tr>
<tr><td>D</td><td>(3,6)</td><td>I</td><td>(6,8)</td></tr>
<tr><td>E</td><td>(3,5)</td><td>J</td><td>(7,8)</td></tr>
</table>
Draw the network diagram for the project.</td><td>[L3][CO2]</td><td>[6M]</td></tr>
<tr><td rowspan="2">7</td><td>a</td><td>Classify the types of planning for network construction?</td><td>[L2][CO2]</td><td>[6M]</td></tr>
<tr><td>b</td><td>Classify the modes of network construction?</td><td>[L2][CO2]</td><td>[6M]</td></tr>
<tr><td>8</td><td colspan="2">Discuss about the steps in development of network.</td><td>[L2][CO2]</td><td>[12M]</td></tr>
<tr><td rowspan="2">9</td><td>a</td><td>Write specification, determine plan breakdown and prepare network for the project of ‘casting a concrete beam over verandah opening.’</td><td>[L3][CO2]</td><td>[6M]</td></tr>
<tr><td>b</td><td>Write about breakdown structure and hierarchies.</td><td>[L1][CO2]</td><td>[6M]</td></tr>
<tr><td rowspan="2">10</td><td>a</td><td>Construct the network for the manufacture of a storage cabinet, given the following specification:
‘A simple storage cabinet is to be manufactured by fabrication and assembly of frame and panels. The cabinet is to be painted. Panels and paint are available from store.’</td><td>[L3][CO2]</td><td>[6M]</td></tr>
<tr><td>b</td><td>Assume that a statue is to be erected in a village square on a stone platform which is to be built on a cement concrete foundation. The statue is to be</td><td>[L3][CO2]</td><td>[6M]</td></tr>
</table>

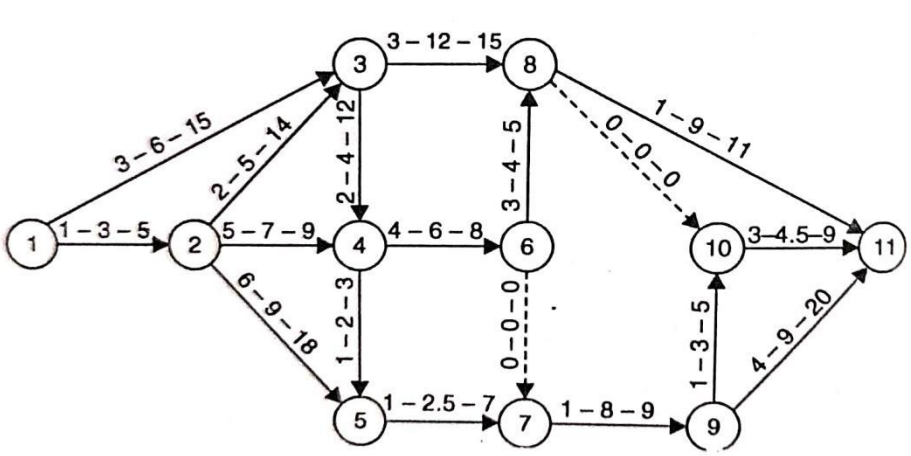
		prepared at another place, moved and erected. The various operations of entire project are given below. The various operations are not in logical sequence. A. Make statue B. Shift statue C. Erect statue D. Lay Foundation E. Construction Platform. Represent the above project by (i) Activity oriented network (ii) Event oriented network.		

Course Code: 19CE0147 **R19**

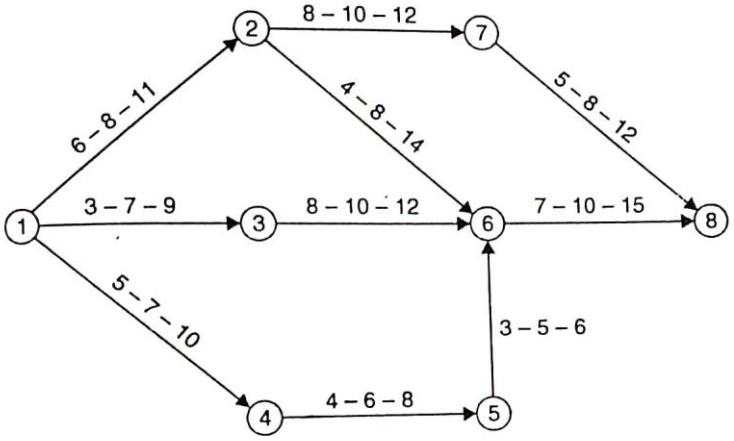
UNIT –III
PERT : TIME ESTIMATES, TIME COMPUTATIONS AND NETWORK ANALYSIS

<table>
<tr><td>1</td><td>a) Define PERT? What are the uses of PERT.
b) What are the different types of time estimates involved in PERT? Explain in detail</td><td>[L1][CO2]
[L2][CO3]</td><td>[4M]
[8M]</td></tr>
<tr><td>2</td><td>What do you understand by the frequency distribution ? How do you determine (i) Most likely time (ii) Variance and (iii) Standard deviation</td><td>[L2][CO3]</td><td>[12M]</td></tr>
<tr><td>3</td><td>What is meant by probability distribution curve ? Differentiate clearly between normal probability distribution curve and beta distribution.</td><td>[L1][CO3]</td><td>[12M]</td></tr>
<tr><td>4</td><td>A project schedule has the following characteristics
a) Construct network diagram
b) Find the estimated duration and variance
c) Find the critical path and expected project completion time
d) What is the probability of completing the project on or before 22 weeks
<table>
<tr><th rowspan="2">Activity</th><th rowspan="2">Predecessor</th><th colspan="3">Duration (weeks)</th></tr>
<tr><th>t_o</th><th>t_m</th><th>t_p</th></tr>
<tr><td>A</td><td>-</td><td>5</td><td>6</td><td>7</td></tr>
<tr><td>B</td><td>-</td><td>1</td><td>3</td><td>5</td></tr>
<tr><td>C</td><td>-</td><td>1</td><td>4</td><td>7</td></tr>
<tr><td>D</td><td>A</td><td>1</td><td>2</td><td>3</td></tr>
<tr><td>E</td><td>B</td><td>1</td><td>2</td><td>9</td></tr>
<tr><td>F</td><td>C</td><td>1</td><td>5</td><td>9</td></tr>
<tr><td>G</td><td>C</td><td>2</td><td>2</td><td>8</td></tr>
<tr><td>H</td><td>E, F</td><td>4</td><td>4</td><td>10</td></tr>
<tr><td>I</td><td>D</td><td>2</td><td>5</td><td>8</td></tr>
<tr><td>J</td><td>H, G</td><td>2</td><td>2</td><td>8</td></tr>
</table></td><td>[L2][CO3]</td><td>[12M]</td></tr>
<tr><td>5</td><td>A project schedule has the following characteristics
a) Construct network diagram
b) Find the estimated duration and variance
c) Find the critical path, slack and expected project completion time
d) What is the probability of completing the project on or before 42 weeks
<table>
<tr><th rowspan="2">Activity</th><th rowspan="2">Dependency</th><th colspan="3">Duration(Days)</th></tr>
<tr><th>t_o</th><th>t_m</th><th>t_p</th></tr>
<tr><td>A</td><td>-</td><td>3</td><td>12</td><td>21</td></tr>
<tr><td>B</td><td>A</td><td>2</td><td>5</td><td>14</td></tr>
<tr><td>C</td><td>A</td><td>6</td><td>15</td><td>30</td></tr>
<tr><td>D</td><td>B</td><td>1</td><td>2</td><td>3</td></tr>
<tr><td>E</td><td>B</td><td>5</td><td>14</td><td>17</td></tr>
<tr><td>F</td><td>C,D</td><td>2</td><td>5</td><td>14</td></tr>
<tr><td>G</td><td>C,D</td><td>4</td><td>5</td><td>12</td></tr>
<tr><td>H</td><td>E, F</td><td>1</td><td>4</td><td>7</td></tr>
</table></td><td>[L2][CO3]</td><td>[12M]</td></tr>
<tr><td>6</td><td>Explain in detail about β- Distribution curve and expected duration.</td><td>[L2][CO3]</td><td>[12M]</td></tr>
<tr><td>7</td><td>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.</td><td>[L3][CO3]</td><td>[12M]</td></tr>
</table>



8	A construction company has an opportunity to submit a bid for the construction of a new apartment building. From the specification provided by the developer, the PERT method along with the three time estimates(in Weeks) for each activity as shown in figure,  Determine : a) Critical path and its standard deviation. b) Probability of completing the work in 38 weeks c) Completion time duration for which the company should bid to provide 95 % probability of completing the project in time	[L3][CO3]	**[12M]**
9	A project has the following characteristics **Activity** | **Predecessor** | **Duration (weeks)** | t_0 | t_m | t_p A | - | 0.5 | 2 | 7 B | A | 1 | 3 | 5 C | A | 1 | 5 | 7 D | B | 3 | 5 | 3 E | C | 2 | 4 | 9 F | C | 3 | 7 | 9 G | D,E | 4 | 6 | 8 H | F | 6 | 8 | 10 I | G,H | 2 | 6 | 8 J | G,H | 5 | 8 | 8 K | I | 1 | 3 | 8 L | J | 3 | 7 | 8 Construct a PERT network and compute the probability that the project will be completed within 30 weeks.	[L3][CO1]	**[12M]**
10	The network for a certain project is shown in figure. Determine the expected time for each of the path . Which path is critical ?	[L3][CO1]	**[12M]**

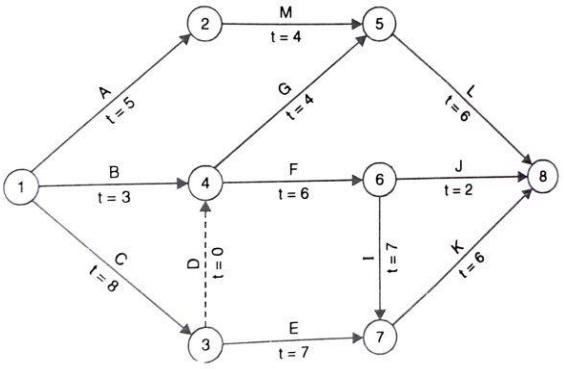
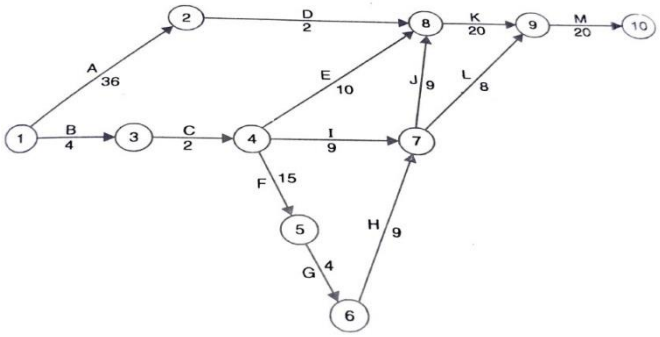
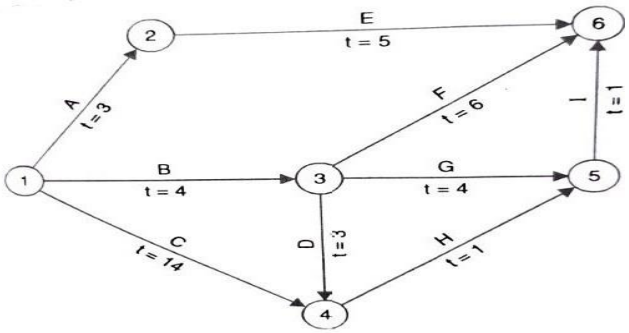
Course Code: 19CE0147 **R19**



Course Code: 19CE0147 **R19**

UNIT –IV

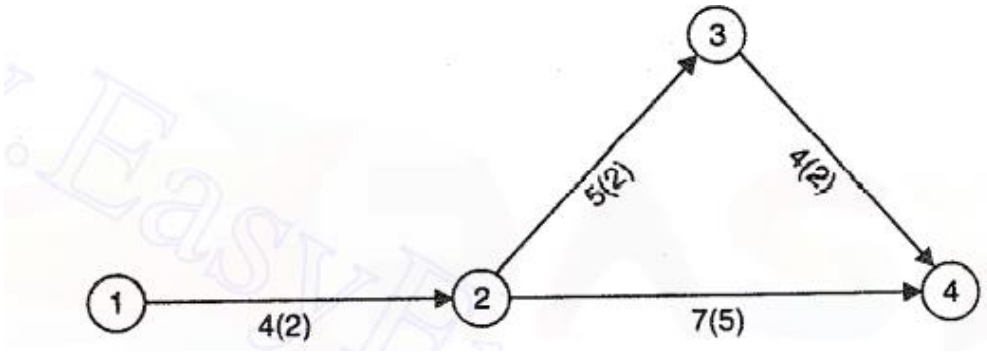
CPM: NETWORK ANALYIS

1	a	Define CPM and Its Applications.	[L1][CO4]	**[6M]**
	b	Explain CPM process with flow chart .	[L2][CO4]	**[6M]**
2	What is CPM Network analysis ? Explain in detail.		[L2][CO4]	**[12M]**
3	a	Briefly explain about Activity time estimate?	[L2][CO4]	**[6M]**
	b	Define Latest start time and Latest finish time.	[L2][CO4]	**[6M]**
4	Define Earliest event time and Latest allowable occurrence time .How are these determined ? Explain the tabular form for the determine these.		[L1][CO4]	**[12M]**
5	What is mean by float? and Differentiate clearly between 'total float' , 'free float and Independent float'.		[L2][CO4]	**[12M]**
6	Explain the tabular form of doing computations for CPM network elements.		[L2][CO4]	**[12M]**
7	What do you understand by critical path ? How is it determined ?		[L1][CO4]	**[12M]**
8	The network for a certain project shown in fig , along with the estimated duration's of various activities .Determine the fallowing. a. Earliest event time and Latest event time b. Earliest and latest start and finish times of each activity  3.	[L2][CO4]	**[12M]**
9	The network for a certain project shown in fig , along with the estimated time of completion of each activity marked. Compute the activity times, and total float, free float and independent float for each activity. locate the critical path on the network.  	[L3][CO4]	**[12M]**
10	The network shown in fig has the estimated duration for each activity marked. Determine total float for each activity and establish the critical path.  	[L3][CO4]	**[12M]**

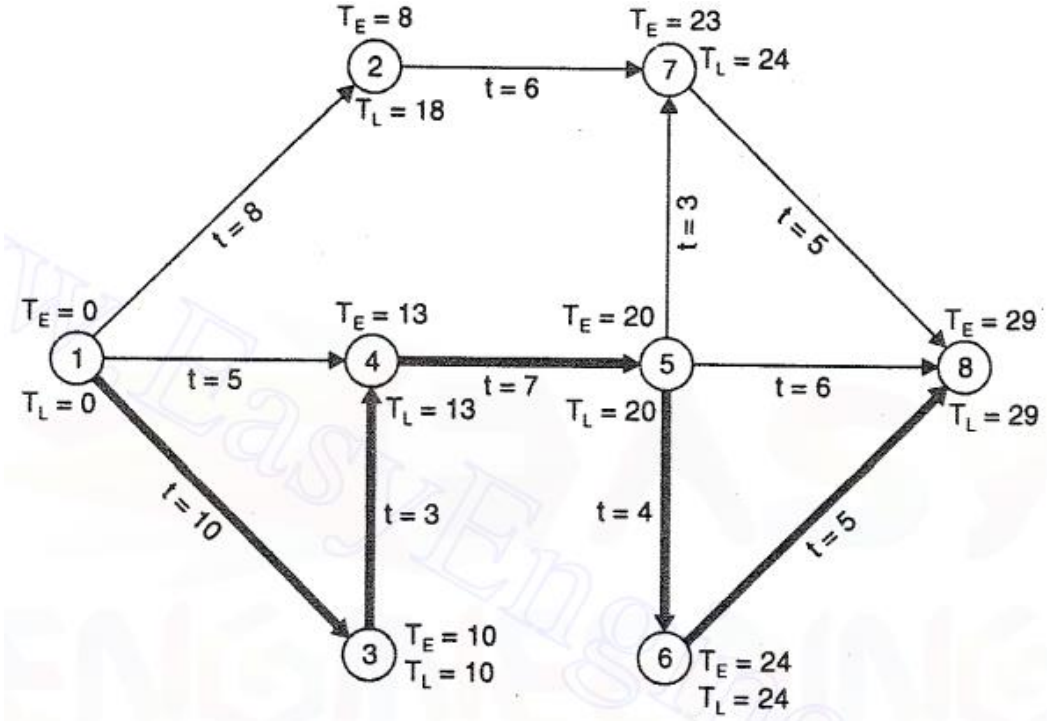
Course Code: 19CE0147 **R19**

UNIT –V

COST MODEL, UPDATING AND RESOURCE ALLOCATION

<table>
<tr><td rowspan="2">1</td><td>a</td><td>Explain briefly about project cost. Also explain what are the steps involved in total project cost.</td><td>[L1][CO5]</td><td>[6M]</td></tr>
<tr><td>b</td><td>Differentiate between project cost and optimum duration in detail with neat sketch</td><td>[L2][CO5]</td><td>[6M]</td></tr>
<tr><td>2</td><td colspan="2">The above table shows the data about durations and cost if various activities of the network shown in the figure
<table>
<tr><th>Activity</th><th>Normal duration (weeks)</th><th>Normal Cost (Rs)</th><th>Crash duration (weeks)</th><th>Crash Cost(Rs)</th></tr>
<tr><td>1-2</td><td>4</td><td>4000</td><td>2</td><td>12000</td></tr>
<tr><td>2-3</td><td>5</td><td>3000</td><td>2</td><td>7500</td></tr>
<tr><td>2-4</td><td>7</td><td>3600</td><td>5</td><td>6000</td></tr>
<tr><td>3-4</td><td>4</td><td>5000</td><td>2</td><td>10000</td></tr>
</table>
The project overhead costs are Rs.2000 per week.Find the optimum duration and cost associated with it, Also, Draw the least cost network.


Figure</td><td>[L2][CO5]</td><td>[12M]</td></tr>
<tr><td>3</td><td colspan="2">Give the information about various activities of network shown in fig.
<table>
<tr><td>Activity</td><td>Normal duration (days)</td><td>Normal Cost (Rs.)</td><td>Crash duration (days)</td><td>Crash cost (Rs.)</td></tr>
<tr><td>1-2</td><td>9</td><td>8000</td><td>6</td><td>9500</td></tr>
<tr><td>2-3</td><td>5</td><td>5000</td><td>3</td><td>5500</td></tr>
</table>
The project overhead costs are @ Rs. 300.0 per day. Determine
(a) Direct cost-duration relationship
(b) Total cost-duration relationship and the corresponding least cost plan (network)</td><td>[L3][CO6]</td><td>[12M]</td></tr>
<tr><td>4</td><td colspan="2">a)Explain about Indirect project cost and Direct project cost.
b)Explain slope of direct cost curve</td><td>[L1][CO5]</td><td>[12M]</td></tr>
<tr><td>5</td><td colspan="2">What do you understand by updating? Why is it essential?</td><td>[L2][CO6]</td><td>[12M]</td></tr>
<tr><td>6</td><td colspan="2">The below figure shows the network of a project which is to be updated at the end of 12days. The following conditions exist at the time of updating:
1. Activity 1-4 was completed as originally planned.
2. Activity 1-3 was execute more rapidly then originally scheduled, and it took 8days for its completion.
3. Activity 3-4 commenced following the completion of activity 1-3 and was finished at the end of 11th day.</td><td>[L2][CO6]</td><td>[12M]</td></tr>
</table>

	4. Activity 4-5 was commenced following the completion of activity 3-4 (i.e., at the end of 11th day), and still requires 6 more days for its completion. 5. Completion of activity 1-2 was delayed drastically, and it still requires 10 more days for its completion. 6. Activity 2-7 will commence following the completion of activity 1-2 and will require 9 days for its completion instead of 6 days originally estimated. 7. The time required to perform activity 5-8 has been revised, based on the experience on the project, gained to this point. It now requires 10 days in the place of 6 days originally estimated. 8. No other activities have been started, and the original time estimates for these activities still appear to be accurate. Update the network, and determine the revised critical path.  		
7	a. What are the data required for updating b. What are the steps involved in the process of updating	[L1][CO5] [L1][CO5]	**[6M]** **[6M]**
8	Explain the process involved in resources smoothing network analysis	[L2][CO6]	**[12M]**
9	Explain about Resources usage profiles histograms	[L2][CO5]	**[12M]**
10	Discuss about a) Resources smoothing b) Resources Levelling	[L2][CO5]	**[12M]**

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