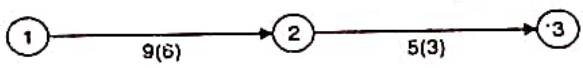
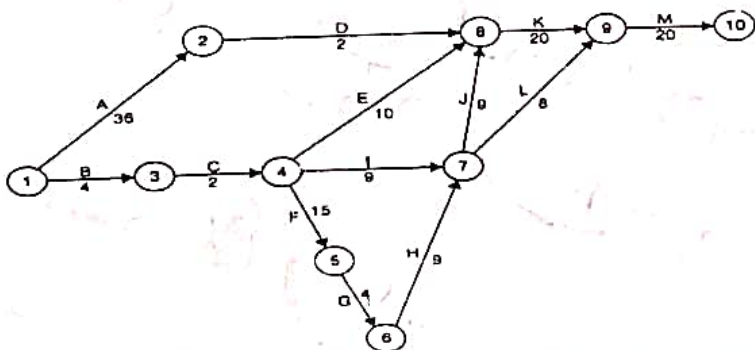


Guru Nanak Dev Engineering College, Ludhiana
Department of Civil Engineering

Program	B.Tech.(CE)	Semester	6
Subject Code	OECE-103	Subject Title	Project Management and Monitoring
Mid Semester Test (MST) No.	2	Course Coordinator(s)	Prof. Gurdeep Singh Prof. Baliyar Singh Prof. Varinder Singh Prof. Arpan Singh
Max. Marks	24	Time Duration	1 hour 30 minutes
Date of MST	24/04/2024	Roll Number	

Note: Attempt all questions

Note: Attempt all questions

Q. No.	Question	COs, RBT level	Marks															
Q1	Brief the terms-EST, EFT, LST, LFT	CO3, L1	2															
Q2	Explain the difference between Direct Cost and Indirect Cost	CO4, L2	2															
Q3	Describe in detail resource smoothing and resource levelling step by step	CO5, L2	4															
Q4	Enlist and discuss the factors governing for updating the project with a suitable example	CO5, L2	4															
Q5	Table gives the information about various activities of network shown in fig. <table border="1"> <thead> <tr> <th>Activity</th><th>Normal Duration(Days)</th><th>Normal Cost(Rs.)</th><th>Crash Duration(Days)</th><th>Crash Cost(Rs.)</th></tr> </thead> <tbody> <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> </tbody> </table> <p>The Project overhead costs are @ Rs.300/- per day. Determine the minimum cost at optimum time duration for the project</p> 	Activity	Normal Duration(Days)	Normal Cost(Rs.)	Crash Duration(Days)	Crash Cost(Rs.)	1-2	9	8000	6	9500	2-3	5	5000	3	5500	CO4, L5	4
Activity	Normal Duration(Days)	Normal Cost(Rs.)	Crash Duration(Days)	Crash Cost(Rs.)														
1-2	9	8000	6	9500														
2-3	5	5000	3	5500														
Q6	The network for a certain project is shown in fig. along with the estimated time of completion of each activity marked 	CO3, L5	8															

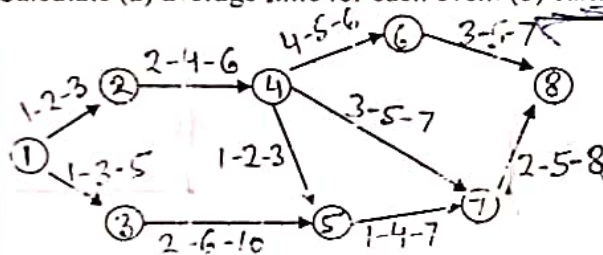
Guru Nanak Dev Engineering College, Ludhiana

Department of Civil Engineering

Program	B.Tech. (EE,ECE,ME,PE,IT,CSE,PE)	Semester	6
Subject Code	OECE-103	Subject Title	PROJECT MANAG MONITORING
Mid Semester Test (MST) No.	1	Course Coordinator(s)	Dr. Gurdeepak Singh Dr. Prashant Garg Prof. Sukhwinder Singh Dr. Heena
Max. Marks	24	Time Duration	1 hour 30 minutes
Date of MST	24.07.23	Roll Number	

Note: Attempt all questions

Q. No.	Question	Marks
Q1	What is critical path? activities that must be finished on time if o	0
Q2	What are the differences between PERT and CPM networks? for the entire p w	4
Q3	What is meant by float time? be complete	4
Q4	What are the types of time estimates?	4
Q5	The three time estimates are given for the project shown below. Calculate (a) average time for each even. (b) earliest expected time for each event.	4

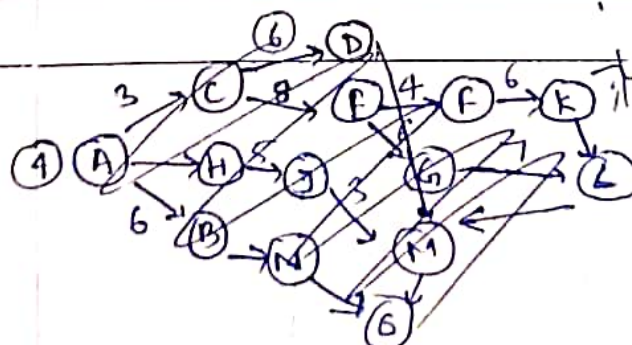


$$t_e = \frac{t_o + 4t_l + t_p}{6}$$

$$T_e = t - t_e$$

Q6 Draw the network and determine critical path.

Activity	Preceded by	Duration (Days)
✓ A	-	4
✓ B	A	6
✓ C	A	3
D	C	6
E	C	8
F	E	4
G	E	6
H	A	5
J	H	3
K	F	6
L	G, K	7
M	D, J, L	8
N	E	5
O	M, N	6



Please

Total No.
Uni. Roll No.

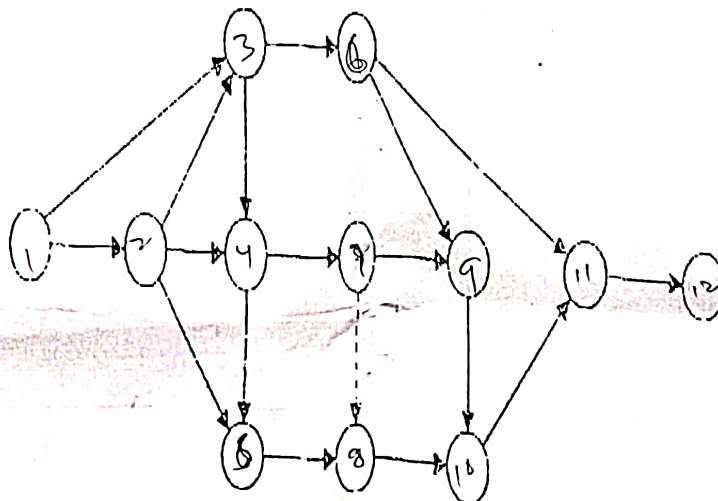
	(a) Compute Earliest Event Time(T_E) and Latest Event Time(T_L) for the network (b) Locate Critical Path on the network (c) Determine all types of floats associated for the given network	
Course Outcomes (CO) <i>Students will be able to</i>		
1	Understand the need of Project Planning and device a plan to define the work to be performed in construction project.	
2	Utilize various tools and techniques of project management and develop more realistic schedule by identifying the central problem and analyze the alternatives.	
3	Analyze time estimates of different activities and events in a network for better controlling of project by identifying critical path	
4	Determine minimum total cost and minimum project time by conducting a crash program	
5	Develop understanding about techniques of updating, allocation of resources and rescheduling a project.	
6	Apply computer skills to project Management and evaluation	

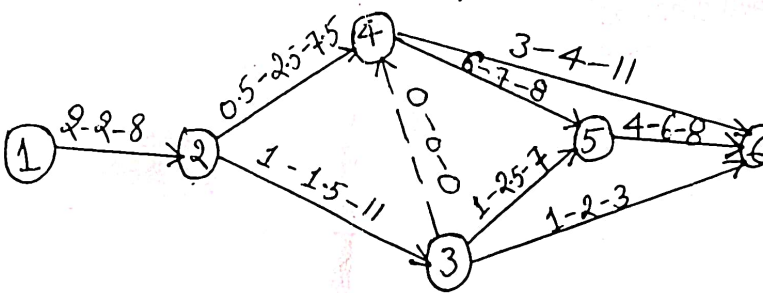
Lower Order Thinking Levels (LOTS) | Higher Order Thinking Levels (HOTS)

Guru Nanak Dev Engineering College, Ludhiana			
Department of Civil Engineering			
Program	B.Tech.(CE)	Semester	6
Subject Code	OECE-103	Subject Title	Project Management and Monitoring
Mid Semester Test (MST) No.	1	Course Coordinator(s)	Prof. Gurdeep Singh Prof. Balihar Singh Prof. Varinder Singh Prof. Arpan Singh
Max. Marks	24	Time Duration	1 hour 30 minutes
Date of MST	14/02/2024	Roll Number	

Note: Attempt all questions

Q. No.	Question	COs, RBT level	Marks
Q1	Explain the difference between PERT and CPM.	CO2, L1	2
Q2	Explain the difference between PERT and CPM.	CO1, L2	2
Q3	Describe the components of Project Management with a suitable example.	CO2, L2	4
Q4	A project consists of SIX(6) activities designated from A to F, with the following relationships: (1) A is the first job to be performed (2) B and C can be conducted concurrently, and must follow A (3) B must precede D (4) E must succeed C, but it cannot start until B is completed (5) The last operation F is dependent on the completion of both D and E Draw the Network Diagram	CO2, L4	4
Q5	Number the events for the following Network using D.R. Fulkerson's rule	CO2, L3	4



Q6/	(a) Discuss the types of Time Estimates in PERT Network. (b) The network for a certain project is shown in the fig. below. Determine the Expected Time for each path. Which Path is critical?	CO3, L5	8
			

Course Outcomes (CO)	
Students will be able to	
1	Understand the need of Project Planning and device a plan to define the work to be performed in construction project.
2	Utilize various tools and techniques of project management and develop more realistic schedule by identifying the central problem and analyze the alternatives.
3	Analyze time estimates of different activities and events in a network for better controlling of project by identifying critical path
4	Determine minimum total cost and minimum project time by conducting a crash program
5	Develop understanding about techniques of updating, allocation of resources and rescheduling a project.
6	Apply computer skills to project Management and evaluation

RBT Classification	Lower Order Thinking Levels (LOFS)			Higher Order Thinking Levels (HOTS)		
RBT Level Number	L1	L2	L3	L4	L5	L6
RBT Level Name	Remembering	Understanding	Applying	Analyzing	Evaluating	Creating

Please check that this question paper contains 9 questions and 2 printed pages within first ten minutes.

[Total No. of Questions: 09]

[Total No. of Pages: 2]

Uni. Roll No. 2104487

Program: B.Tech. Civil (Batch 2018 onward)

Semester: 6th

Name of Subject: Project Management & Monitoring

Subject Code: OECE-103

Paper ID: 17154

Scientific calculator is Allowed

Time Allowed: 03 Hours

Max. Marks: 60

NOTE:

- 1) Parts A and B are compulsory
- 2) Part-C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice
- 3) Any missing data may be assumed appropriately

Part – A

[Marks: 02 each]

Q1.

- a) What are the differences between PERT and CPM networks?
- b) What are indirect costs of a project?
- c) What are the differences between forward and backward pass?
- d) What is work break-down structure?
- e) What is critical path?
- f) What are the meanings of bar chart?

Part – B

[Marks: 04 each]

Q2. Explain with example Fulkerson's rule for numbering the events of a network.

Q3.

Q4. Give various steps used in the method of resource smoothing.

Q5.

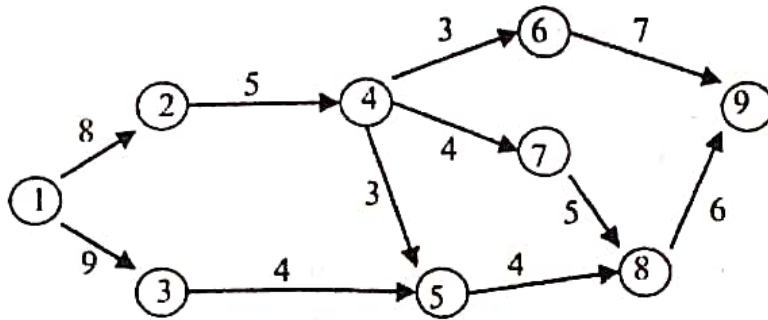
What are the various types of network planning techniques?

Q6.

Discuss various types of network planning techniques.

Q7. The time estimate is given for the CPM project shown below. Calculate

- (a) Earliest expected time for each event
- (b) Latest allowable occurrence time for each event
- (c) Critical path



Part – C

[Marks: 12 each]

- Q8. What is optimum cost of a project? Discuss the steps for achieving optimum duration and optimum cost.

OR

A maintenance project consists of number of jobs. Their normal duration and costs along with crash costs and duration are given below. Find out the optimum project cost and time; Indirect cost is Rs.500 / day

Job	Normal duration (days)	Normal Cost (Rs.)	Crash duration (days)	Crash Cost (Rs.)
1-2	7	8000	5	10000
1-3	9	3000	6	4500
1-4	12	7000	9	9100
2-4	4	1000	3	1800
3-4	8	8000	7	9200
4-5	3	2000	2	2400

- Q9. What is necessity of updating process? Discuss the process of updating.

OR

For a network shown in fig of question no. 7, the conditions of project are as follows after working 10 days on project:

- Activities 1-2, 1-3 are complete.
- Activity 2-4 is progressing from 5 days and require 6 more days for completion.
- Activity 3-5 is progressing from 4 days and require 5 more days for completion.
- Activity 8-9 is reassessed to complete in 8 days.

Update existing network.

Please check that this question paper contains 9 questions and 4 printed pages within first ten minutes.

[Total No. of Questions: 09]

[Total No. of Pages: 4]

Uni. Roll No. 2004448

Program: B.Tech. (Batch 2018 onward)

Semester: 6/ (2018)

Name of Subject: Project Management and Monitoring

Subject Code: OECE-103

Paper ID: 17154

Scientific calculator is Allowed

Time Allowed: 03 Hours

Max. Marks: 60

NOTE:

- 1) Parts A and B are compulsory
- 2) Part-C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice
- 3) Any missing data may be assumed appropriately

Part – A

[Marks: 02 each]

Q1.

- a) How does it differ from a program?
- b) What is a project plan?
- c) Why project planning is important?
- d) What is a breakdown structure? Explain with the help of a suitable example.
- e) Explain Fulkerson's rule for numbering the events of a network.
- f) A *project plan* consisting of ten events have predecessor relationships as under:

Event	Immediate Predecessor	Event	Immediate Predecessor
1	---	6	3, 5
2	1	7	3, 4
3	2	8	3, 7
4	2	9	7
5	2	10	3, 6, 8, 9

Draw a network diagram for the project plan.

[Marks: 04 each]

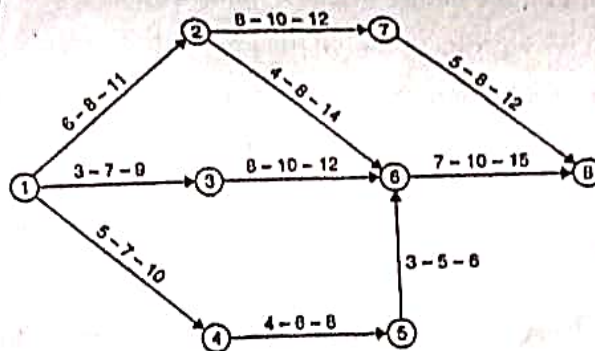
Part – B

- Q2. Differentiate between 'forward planning', 'backward planning', and 'combined planning'.
- Q3. What do you understand by updating? Why is it essential?
- Q4. Discuss various rules for providing dummies in a network.
- Q5. A project consists of six activities (jobs) designated from A to F, with the following relationships:

- A is the first job to be performed.
- B and C can be conducted concurrently, and must follow A
- B must precede D.
- E must succeed C, but it cannot start until B is completed.
- The last operation F is dependent on the completion of both.

Draw the network diagram.

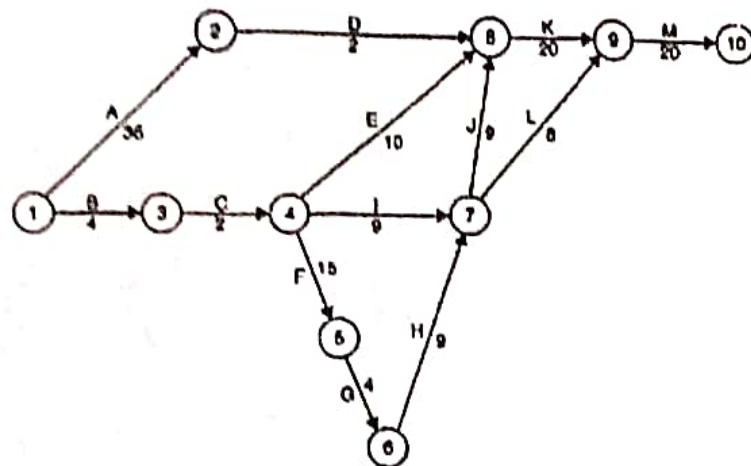
- Q6. What is meant by normal probability distribution curve? Differentiate clearly between normal probability distribution and beta distribution curve.
- Q7. The network shown for a certain project is shown in the figure below. Determine the expected time for each of the path. Also mark the critical path.



Part – C

[Marks: 12 each]

- Q8. The network for a certain project is shown in figure given below, along with the estimated time of completion of each activity marked.

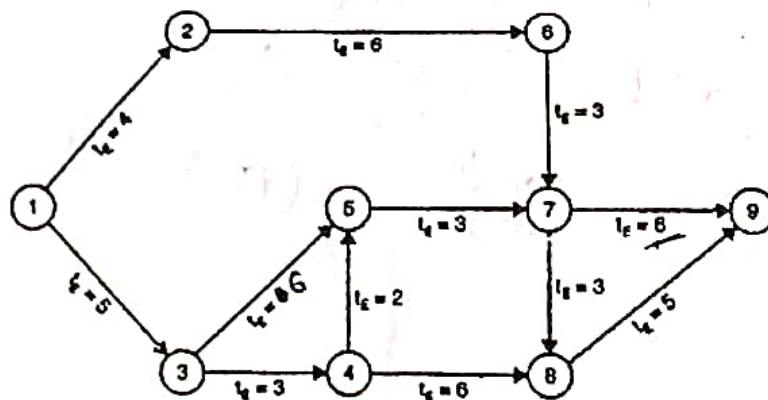


Compute the activity times, total float, free float and independent float for each activity. Also locate the critical path on the network.

OR

Define the terms (a) direct cost, (b) indirect cost, (c) outage loss, (d) normal project time, (e) normal cost, (f) crash time and crash cost.

Q9. The network for a construction project is shown in figure below with the expected time of completion of each activity.

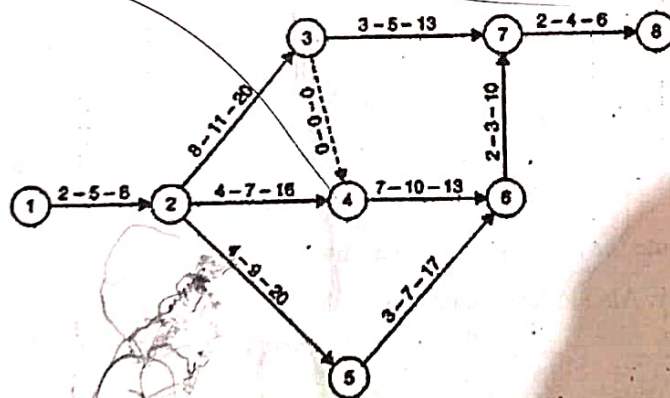


Determine the earliest expected time and latest occurrence time for each event. Also determine the critical path. It is given that the scheduled completion time is 21 days.

OR

For a construction project, network diagram given below, determine the following:

- Critical path and its standard deviation
- Probability of completion of the project in 40 days
- Time duration that will provide 95% probability of its completion in time.



EVENING

[Total No. of Questions: 09]

06 DEC 2023

[Total No. of Pages: 05]

Uni. Roll No.

Program: B.Tech. (Batch 2018 onward)

Semester: 6th

Name of Subject: Project Management and Monitoring

Subject Code: OECE-103

Paper ID: 17154

Scientific calculator is Allowed

Time Allowed: 03 Hours

Max. Marks: 60

NOTE:

- 1) Parts A and B are compulsory
- 2) Part-C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice
- 3) Any missing data may be assumed appropriately

Part – A

[Marks: 02 each]

Q1.

- a) Define the term *scheduling* and what are the different phases of scheduling?
- b) Name any two softwares which can be employed for planning and monitoring of a project?
- c) Explain in brief the difference between PERT and CPM networks. Explain the circumstances in which one is preferred over the other.
- d) Describe the use of Dummies in the network diagrams.
- e) A project consists of eight activities *A, B, C, D, E, F, G and H* with their times of completion as follows:

Activity	Duration (Weeks)	Activity	Duration (Weeks)
A	2	F	4
B	4	G	5
C	2	H	4
D	4		
E	6		

The predecessor relationships are as follows:

A and *B* can be preferred in parallel.

C and *D* can not start until *A* is complete.

E can not start until half the work of activity *C* is complete.

EVENING

06 DEC 2023

06 DEC 2023

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[Marks: 04 each]

06 DEC 2023

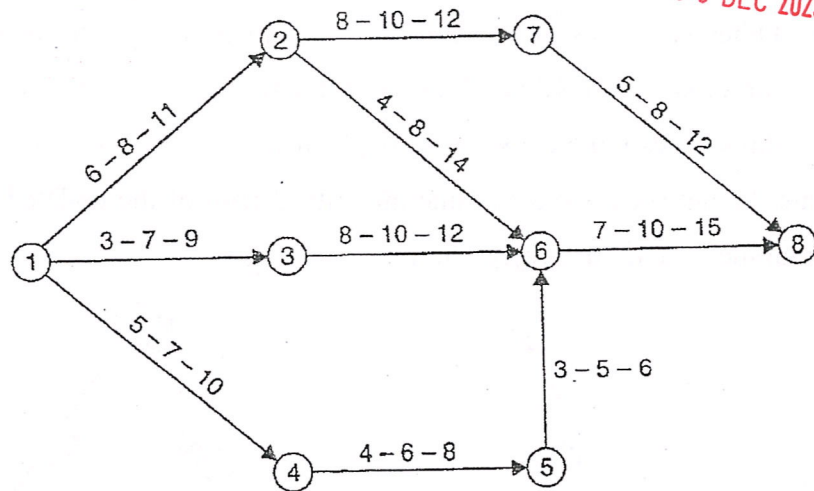
06 DEC 2023

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06 DEC 2023

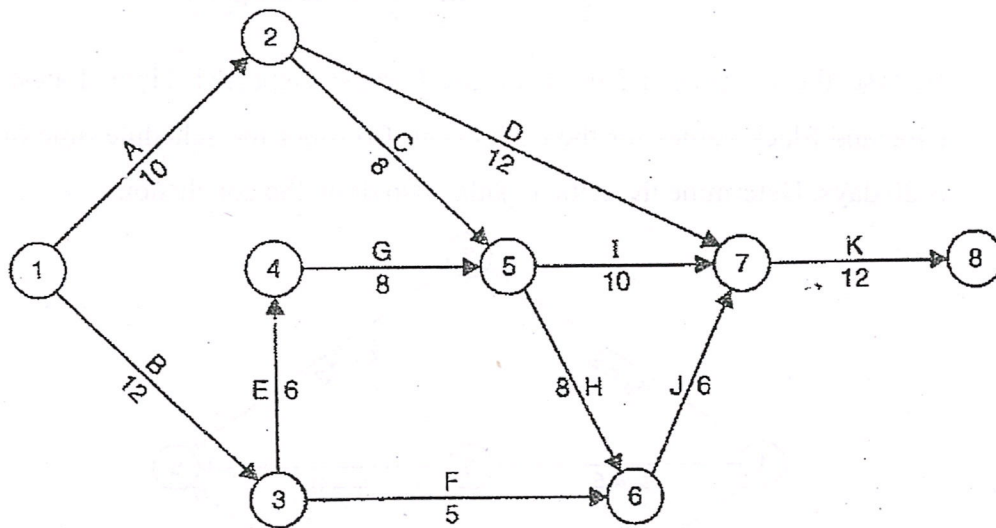


- Q7. Define 'normal project time', 'normal cost', 'crash time', 'crash cost', 'direct cost', 'indirect cost' and 'outage loss'.

Part – C

[Marks: 12 each]

- Q8. Compute Earliest Event Time, Latest Allowable Time, for the following network.



OR

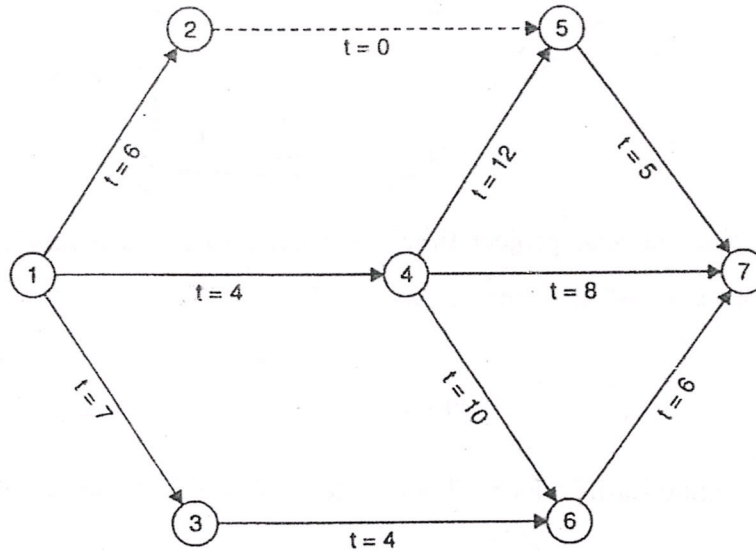
A network for a project shown in figure. The network is to be updated for after 10 days of its execution. The following conditions exists at the end of 10 days:

- Activity 1-2, 1-3, 1-4 have been completed originally scheduled.
- Activity 4-5 is in progress and will require 6 more days for its completion.
- Activity 4-6 is in progress and will require 6 more days to complete.
- Activity 3-6 is in progress and will require 1 more days to complete.

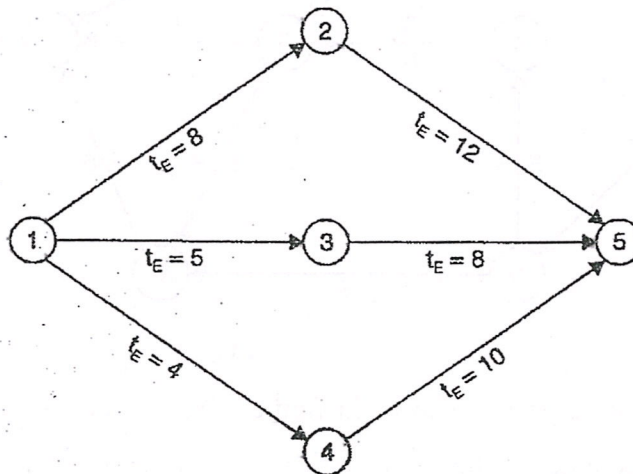
06 DEC 2023

- 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?



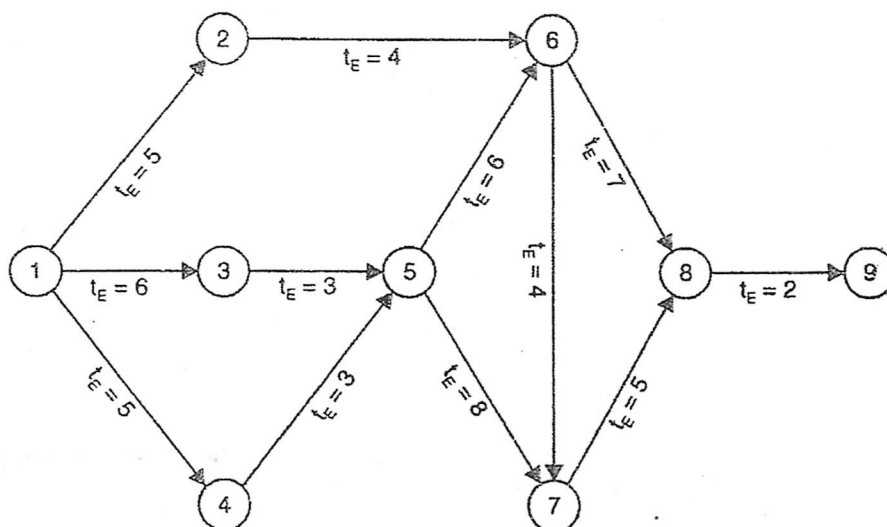
- Q9.** Analyse the network using PERT for Earliest Expected Time, Latest Occurrence Time and Slack values for the each event. Consider the schedule time of completion as 20 days. Determine the critical path. Also draw the conclusions.



OR

06 DEC 2023

The network for a construction project is shown in figure below with the expected time of completion of each activity in weeks.



Determine the earliest expected time and latest occurrence time for each event. Also determine the critical path. It is given that the scheduled completion time is 26 weeks.

[Total No. of Questions:09]

[Total No. of Pages:..3..]

Uni. Roll No.

Program: Program: B.Tech. (Batch 2018 onward)

Semester: 6TH

Name of Subject: Project Management and Monitoring

Subject Code: OECE-103

Paper ID: 17154

MORNING

20 SEP 2022

Time Allowed: 03 Hours

Max. Marks: 60

NOTE:

- 1) Parts A and B are compulsory
- 2) Part-C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice
- 3) Any missing data may be assumed appropriately

Part – A

[Marks: 02 each]

Q1.

- a) Distinguish between activity and event.
- b) What do you understand by a dummy? What are its uses
- c) List the main drawbacks of Bar charts.
- d) What are the objectives of Project management.
- e) Define Slack.
- f) Name any four software's used in project management.

Part – B

[Marks: 04 each]

Q2. What is meant by project planning? Discuss the advantages of planning a project.

Q3. Discuss the D.R. Fulkerson's method of numbering the events of network.

Q4. For an activity of a project, time estimates received from three engineers P, Q and R are as follows:

	Optimistic time	Most likely time	Pessimistic time
Engineer P	12	11	17
Engineer Q	8	9	15
Engineer R	6	12	14

State which Engineer is more certain about the time of completion of the activity?

Q5. Write short notes on Resource scheduling.

Q6. Find the earliest expected times of all the events of network shown in fig.1.

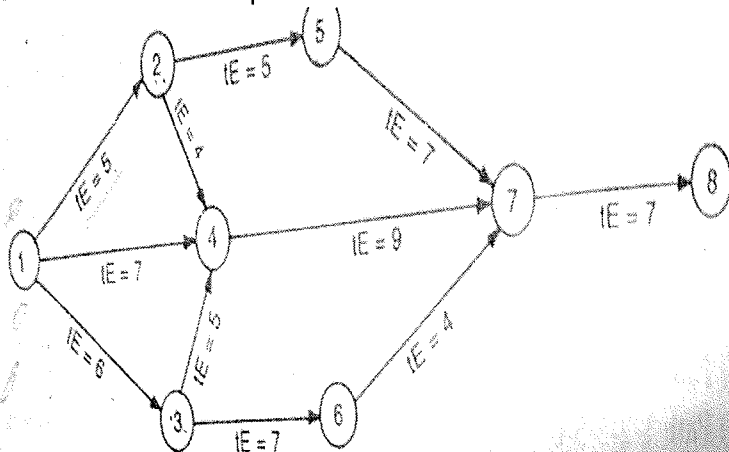


Figure 1

Q7. A project consists of eight activities M, N, O, P, Q, R, S and T. Draw the network and number the events if

- Activities M, N and Q can start simultaneously.
- Activities O and P can start concurrently and depend on the completion of M and N both.
- Activities R and S are also Concurrent and depend on completion of activity O.
- Activity T depends upon completion of P, Q and R.
- The project is complete on the completion of activities S and T.

Part – C

[Marks: 12 each]

Q8. For the given PERT network as shown in Figure 2. Determine the expected mean time, variance and standard deviation of the project. At what time you are sure (90%) that the project will be finished in time.

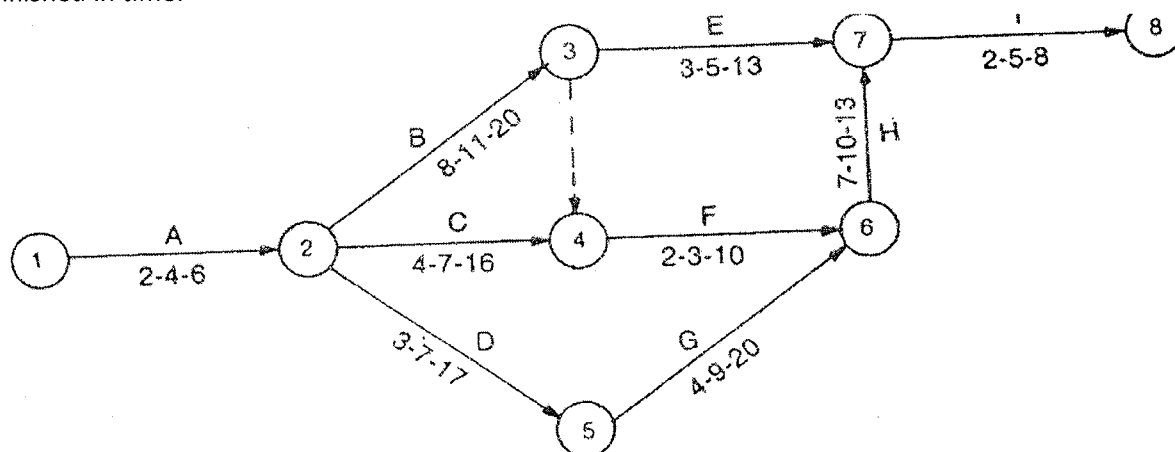


Figure.2

OR

For the given CPM network shown in fig.3 determine the earliest and latest start and finish time for all activities and determine the total, free and independent floats for all the activities in tabular form. Also find critical path and project duration.

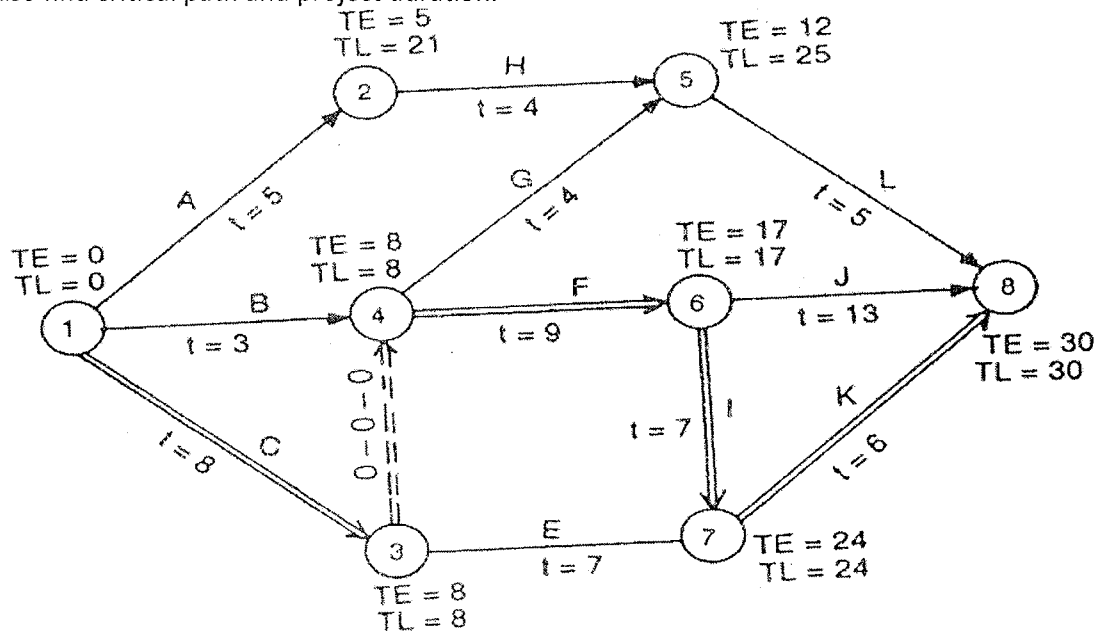


Figure.3

Q9. Network for small job is shown in fig4. and requirement of manpower for various activities is given. Calculate the resource allocation/levelling for the job.

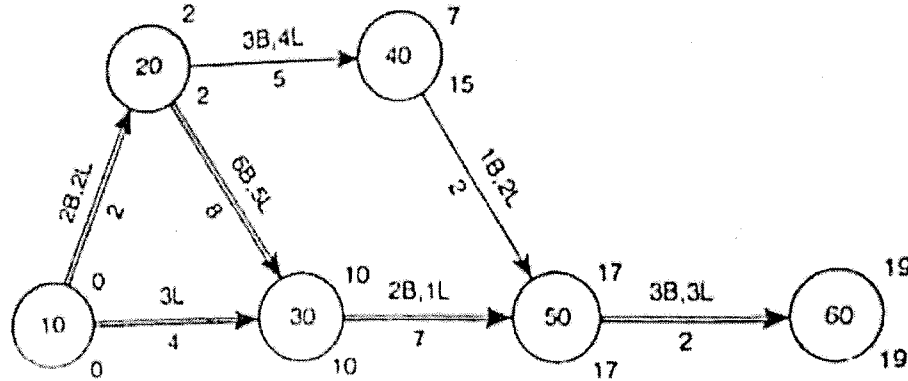


Figure.4

Requirement of Manpower

Activity(ij)	Duration (days)	Requirement per day of activity	
		Bar-benders (B)	Labourers(L)
10-20	2	2	2
10-30	4	-	3
20-30	8	6	5
20-40	5	3	4
30-50	7	2	1
40-50	2	1	2
50-60	22	3	3

OR

What do you understand by cost slopes? How do you determine it? Draw a typical cost duration curve and show on it, optimum duration and minimum project cost. Also explain the method of times-cost optimization of project network.

Standard normal distribution function

Normal deviation Z (+)	Probability percent (Pr)	Normal deviation Z (-)	Probability percent (Pr)
0	50.0	0	50
+ 0.1	53.98	- 0.1	46.02
+ 0.2	57.93	- 0.2	42.07
+ 0.3	61.79	- 0.3	38.12
+ 0.4	65.54	- 0.4	34.46
+ 0.5	69.15	- 0.5	30.85
+ 0.6	72.57	- 0.6	27.43
+ 0.7	75.8	- 0.7	24.20
+ 0.8	78.81	- 0.8	21.19
+ 0.9	81.59	- 0.9	18.41
+ 1.0	84.13	- 1.0	15.87
+ 1.1	86.43	- 1.1	13.57
+ 1.2	88.49	- 1.2	11.51
+ 1.3	90.32	- 1.3	9.68
+ 1.4	91.92	- 1.4	8.03
+ 1.5	93.32	- 1.5	6.68
+ 1.6	94.52	- 1.6	5.48

[Total No. of Questions:09]

EVENING

[Total No. of Pages:03]

Uni. Roll No.

Program: B. Tech

21 JAN 2023

Semester: 6TH

Name of Subject: Project Management and Monitoring

Subject Code: OECE-103

Paper ID: 17154

Time Allowed: 03 Hours

Max. Marks: 60

NOTE:

- 1) Parts A and B are compulsory
- 2) Part-C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice
- 3) Any missing data may be assumed appropriately

Part – A

[Marks: 02 each]

- Q1 a) List the main advantages of PERT. Why are they so popular?
- b) What is a Dummy activity?
- c) What is the significance of PERT for research project?
- d) Discuss the advantages of Scheduling.
- e) Name any four software's used in project management.
- f) What are the various types of time estimates?

Part – B

[Marks: 04 each]

- Q2 "Planning is the starting point of all management functions" Discuss.

- Q3 For a residential building, the activities are performed as given in table.

Activity	Duration(weeks)	Description
A	3	After the completion of activity A, the activities B and C can be performed simultaneously.
B	4	
C	6	
D	5	Activity D can start only after completion of activity B
E	3	Activity E can start after completion of activities B and C
F	4	Activity F can start after completion of activities D and E
G	6	Activity G can start only after completion of activity C only.

Prepare a bar chart of above construction and find out the total time taken for the completion of the project.

- Q4 Explain the method of time-cost optimization of project network.
- Q5 Define the terms 'direct cost', & 'indirect cost'. Draw the total cost curve and show on it how direct and indirect cost vary with time.

21 JAN 2023

Q6 Using Fulkerson's rule, number the events of the network shown in Figure – 1.

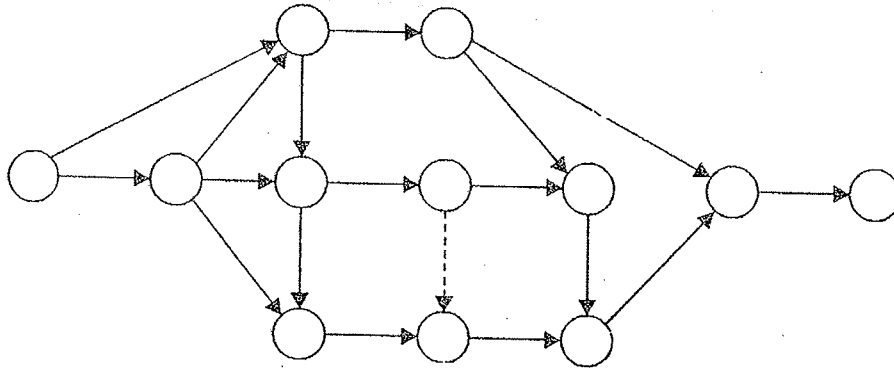


Figure 1

Q7 Given the following information, develop a network showing activity precedence relationship and find the length of critical path.

Activity	Description	Immediate Predecessor	Duration (days)
A	Build Internal Component	--	3
B	Modify roof and floor	--	5
C	Construct collection stack	A	3
D	Pour concrete and install frame	A,B	4
E	Build high-temperature Burner	C	6
F	Install pollution control system	C	4
G	Install air pollution device	D,E	6
H	Inspect and test.	F,G	7

Part – C

[Marks: 12 each]

Q8 For the given CPM network shown in fig.2 determine the earliest and latest start and finish time for all activities and determine the total, free and independent floats for all the activities in tabular form. Also find critical path and project duration.

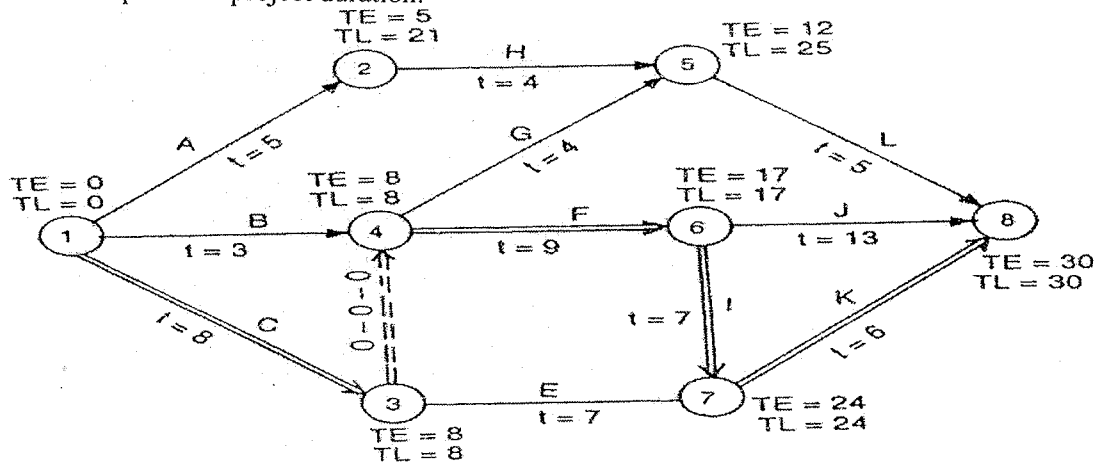


Fig.2

OR

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The network for a certain project is shown in Figure – 3. Determine the expected time for each path. Which path is critical?

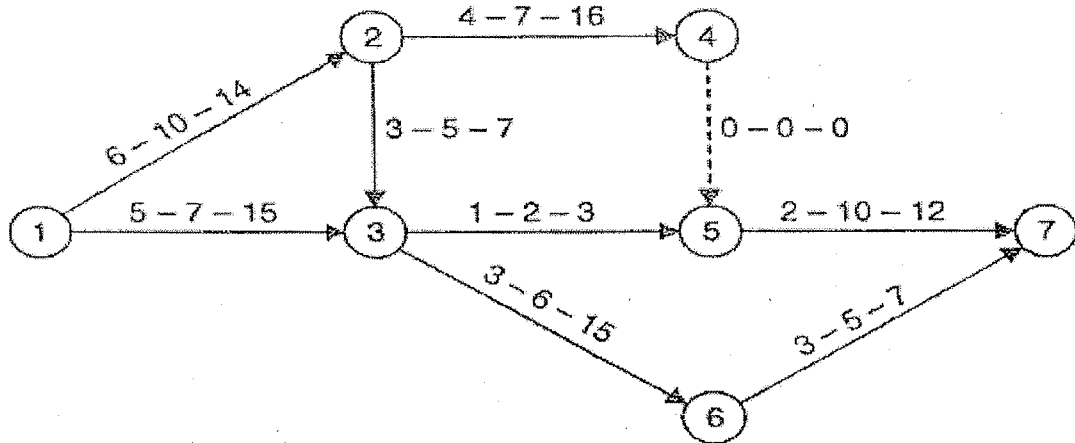


Fig.3

Q9

What are the objectives of resource planning and resource allocation? Discuss in detail resource smoothing and resource levelling step by step.

OR

Explain the term Updating a project. Why is it necessary? What data is necessary for updating? Discuss when updating should be performed and what methods are adopted for updating the project.
