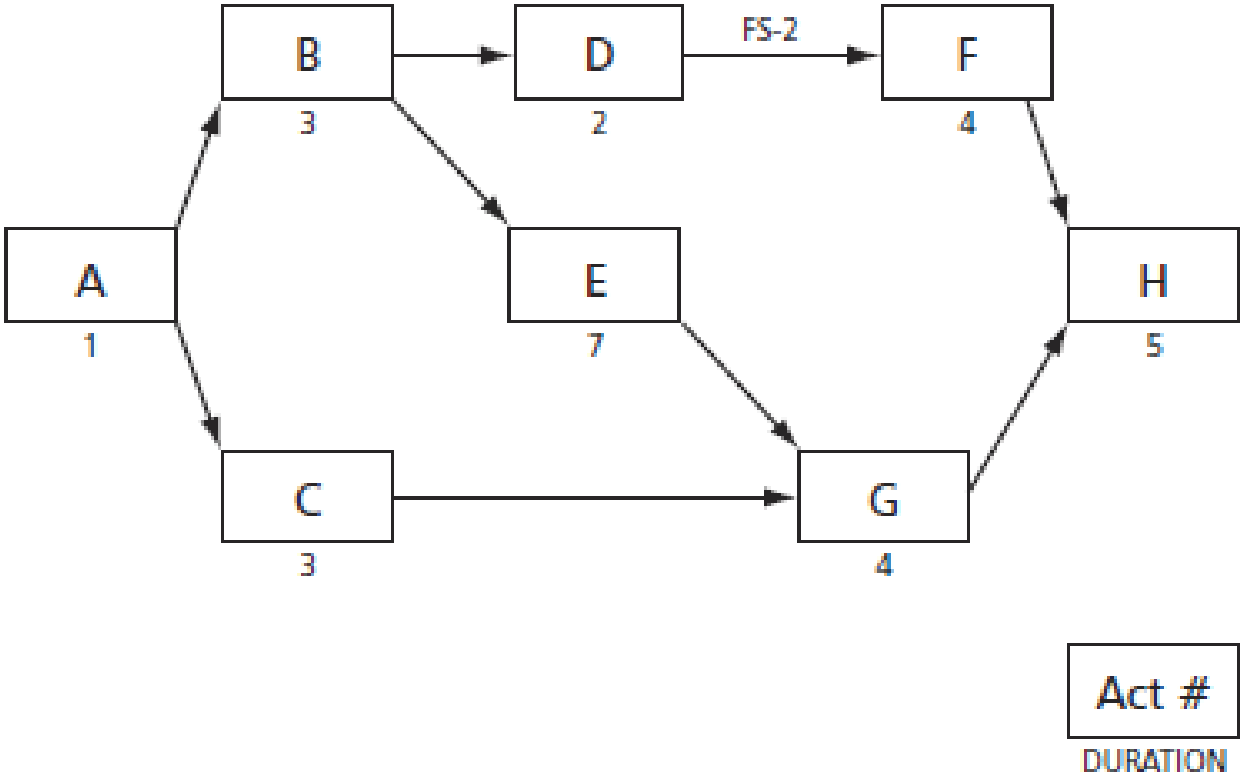
The following information and questions 1 through 10 refer to figure 1.

A schedule was developed for a project to install windows in an apartment building. The project is a rush job, and the contractor has agreed to schedule the work on a single shift basis but will work seven days per week until the job is done. The project is to begin on May 1.

Figure 1. Scheduling Practice Exercise.



1. What day in May will activity D have for its early finish date?

   a. May 13
   b. May 6
   c. May 7
   d. May 5

2. What is the free float for activity F?

   a. 6
   b. 7
   c. 0
   d. 8

3. What is the free float for activity D?

   a. 6
   b. 7
   c. 8
   d. 0

4. What is the critical path of the project?

   a. A B E G H
   b. A B D F H
   c. A C G H
   d. A B E D F H

5. What is the late start for activity F?

   a. May 10
   b. May 11
   c. May 12
   d. May 14

6. How long is the project in days?

   a. Nineteen
   b. Twenty
   c. Twenty-one
   d. Eighteen

7. What is the early start for activity F?

   a. May 7
   b. May 6
   c. May 5
   d. May 4

8. If there is a delay in activity F of six days, what is the effect on the project completion date?

    a. Increases one day
    b. No change to project completion date
    c. Increases two days
    d. Increases three days

9. What is the early finish date of activity A?

    a. May 1
    b. May 2
    c. May 3
    d. May 4

10. The above diagram is called:

    a. Activity on arrow network diagram.
    b. Network diagram.
    c. Precedence diagram.
    d. Gantt chart.

11. If a project manager were to make Thanksgiving dinner, two of the activities that might be of concern would be roasting the turkey and baking the sweet potatoes. In order to ensure that these two items will be finished cooking and will come out of the oven at the same time, what type of relationship should he or she use in the schedule between these two activities?

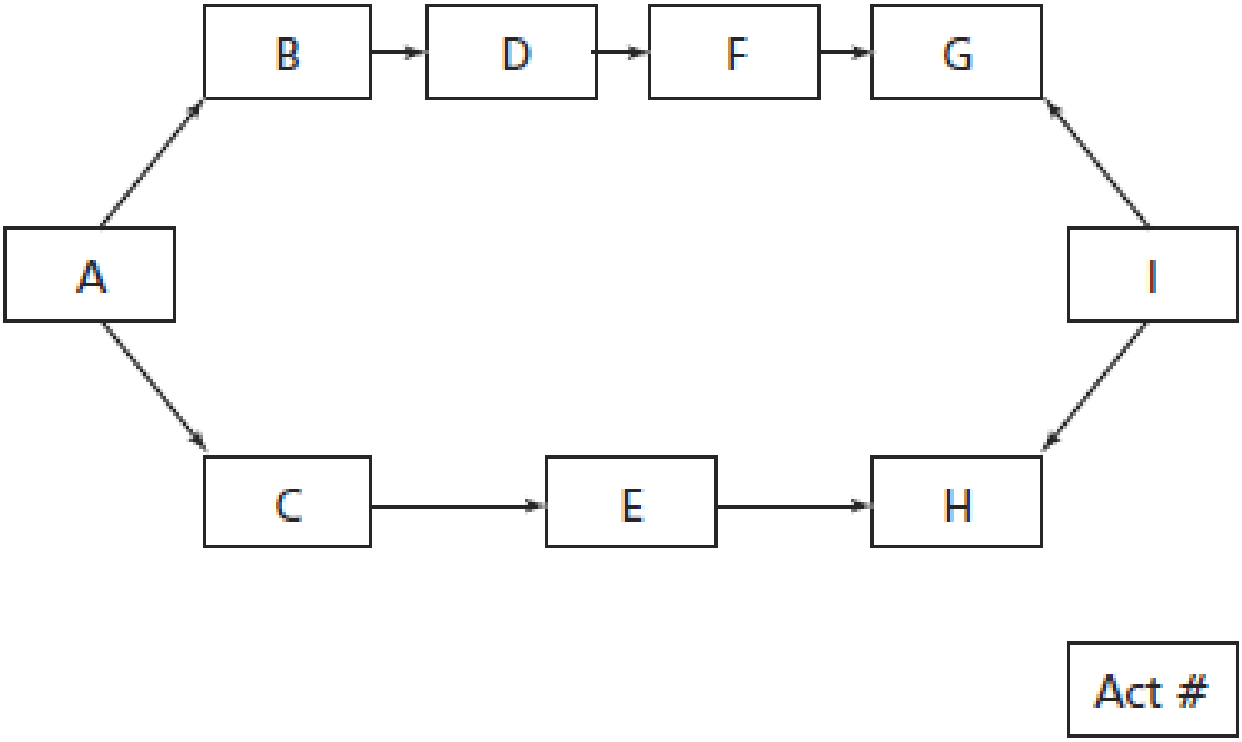
    a. Finish-finish
    b. Start-start
    c. Finish-start
    d. Start-finish

Questions 12 through 15 refer to the diagram in figure 2 and the table that follows.

In a project to install concrete sewer lines there is a lot of uncertainty as to how long the durations should be for the tasks involved. The project manager has determined that the team will use the PERT technique to evaluate the project's completion date. The diagram shows nine activities and the

table shows the optimistic, pessimistic, and most likely estimates that the team has already made.

Figure 2. PERT Diagram.



Activity	Optimistic	Pessimistic	Most Likely
A	1	1	1
B	2	3	3
C	10	13	12
D	5	5	5
E	3	6	4
F	1	1	1
G	5	8	6
H	9	13	10
I	5	5	5

12. What is the expected value of the number of days to complete the project?

    a. 47.3
    b. 22.0

c. 32.3
d. 48

13. It is desirable to make an estimate that has a greater than 95% chance of being correct. Which of the following ranges of time for the completion of the project best describes this probability of being correct?

a. 33.31 to 31.36
b. 34.28 to 30.39
c. 14.39 to 33.48
d. 35.25 to 29.42

14. What is the expected value of the duration for activity B?

a. 5.6
b. 2.8
c. 3.0
d. 2.6

15. What is the standard deviation for the duration of activity B?

a. 1.000
b. .133
c. .166
d. 1.413

The following table and description refer to questions 16 through 22.

A project manager is using the earned value reporting method to manage his project. The following table shows the data collected to date. The plan is for the project to be complete after eight weeks. The earned value report shows data collected for the first four weeks of the project. The figures shown in the table are cumulative.

Week	PV	AC	EV
1	1,000	1,000	1,000
2	3,000	2,000	2,500
3	5,000	5,000	6,000
4	7,000	9,000	7,000
5	13,000		
6	17,000		
7	19,000		
8	20,000		

16. What is the cost performance index for week 4?

    a. 1.000
    b. 0.777
    c. 1.286
    d. 1.250

17. What is the schedule performance index for week 3?

    a. 1.200
    b. 0.833
    c. 1.000
    d. 1.500

18. What is the BAC for the project during week 4?

    a. 7,000
    b. 9,000

c. 5,000
d. 20,000

19. During week 5 it is found that some of the work that was reported complete in week 2 was considered unacceptable. It will require $500 to fix the problem and make this work acceptable. The work is scheduled to be done in week 6. No other work is reported to be complete during week 5. What is the EV for week 5?

a. 7,000
b. 6,500
c. 9,000
d. 5,000

20. What is the cost variance for week 4?

a. 0
b. −2,000
c. 2,000
d. 7,000

21. What is the schedule variance in week 2?

a. 500
b. 1,000
c. −500
d. −1,000

22. What is the EAC at week 4?

a. 20,000
b. 15,555
c. 25,740
d. 17,717

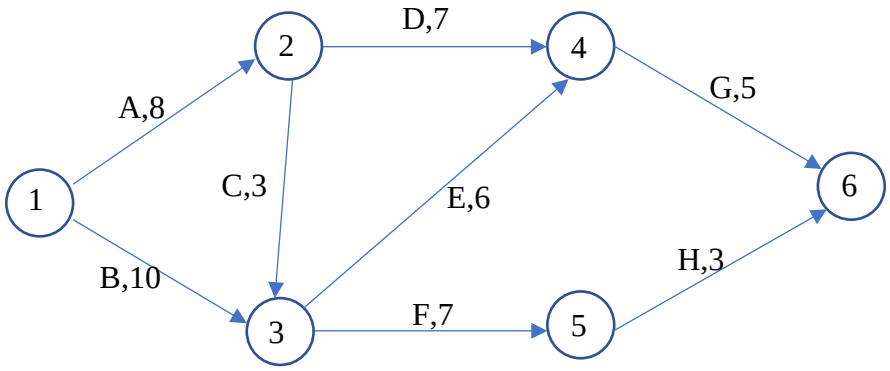
23. Construct AON and AOA network based on following information:

a) A < C
B < E
C < D, E

b) A < D, E
B < E, F
C < F

(A < C indicates that activity A is the predecessor of activity C.)

24. Below figure is the AOA network for ZYX project:



a) What is the critical path of this project?

b) Identify the project completion time.

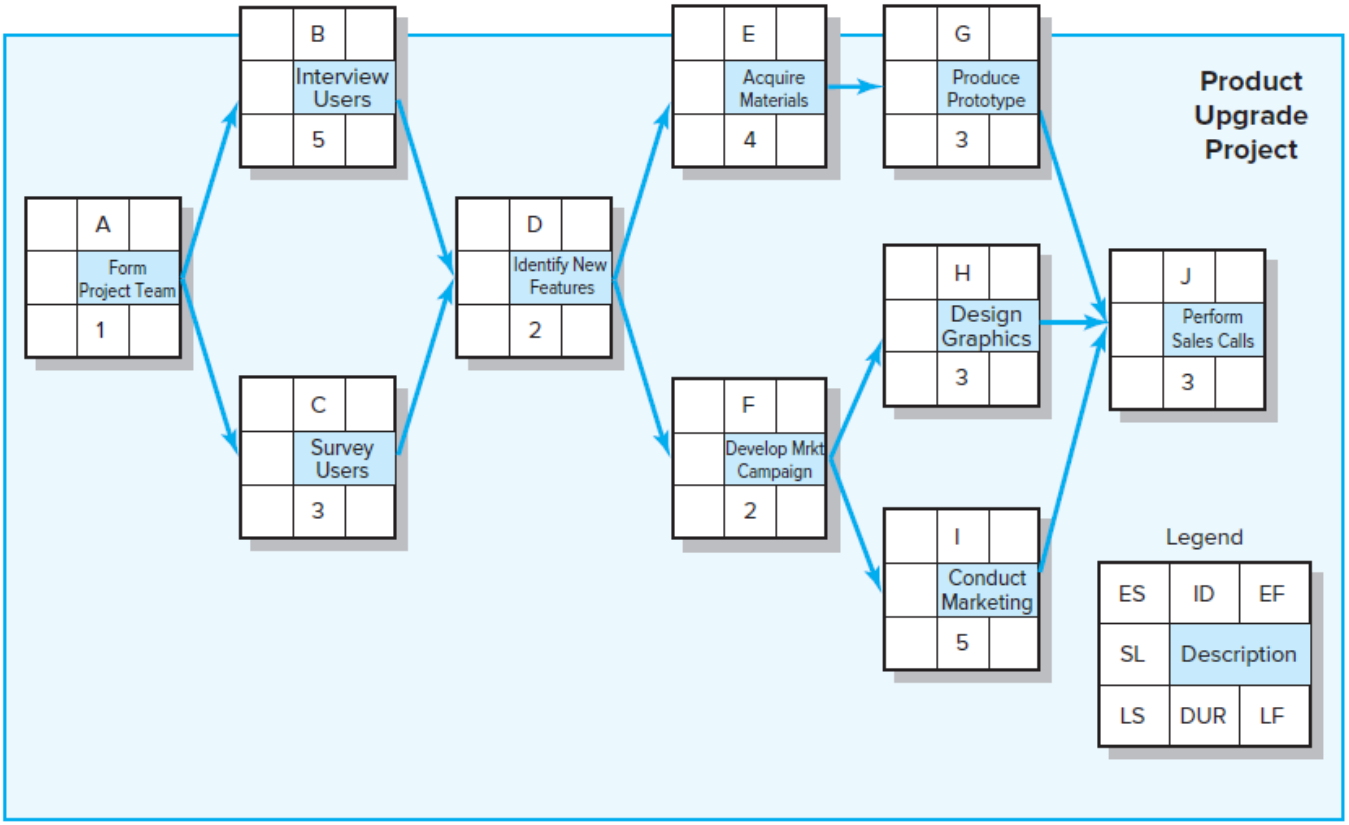
c) Is it possible for delaying activity B without affecting on the project completion date? If yes, then how many days can activity B be delayed?

d) Convert this AOA network into AON network.

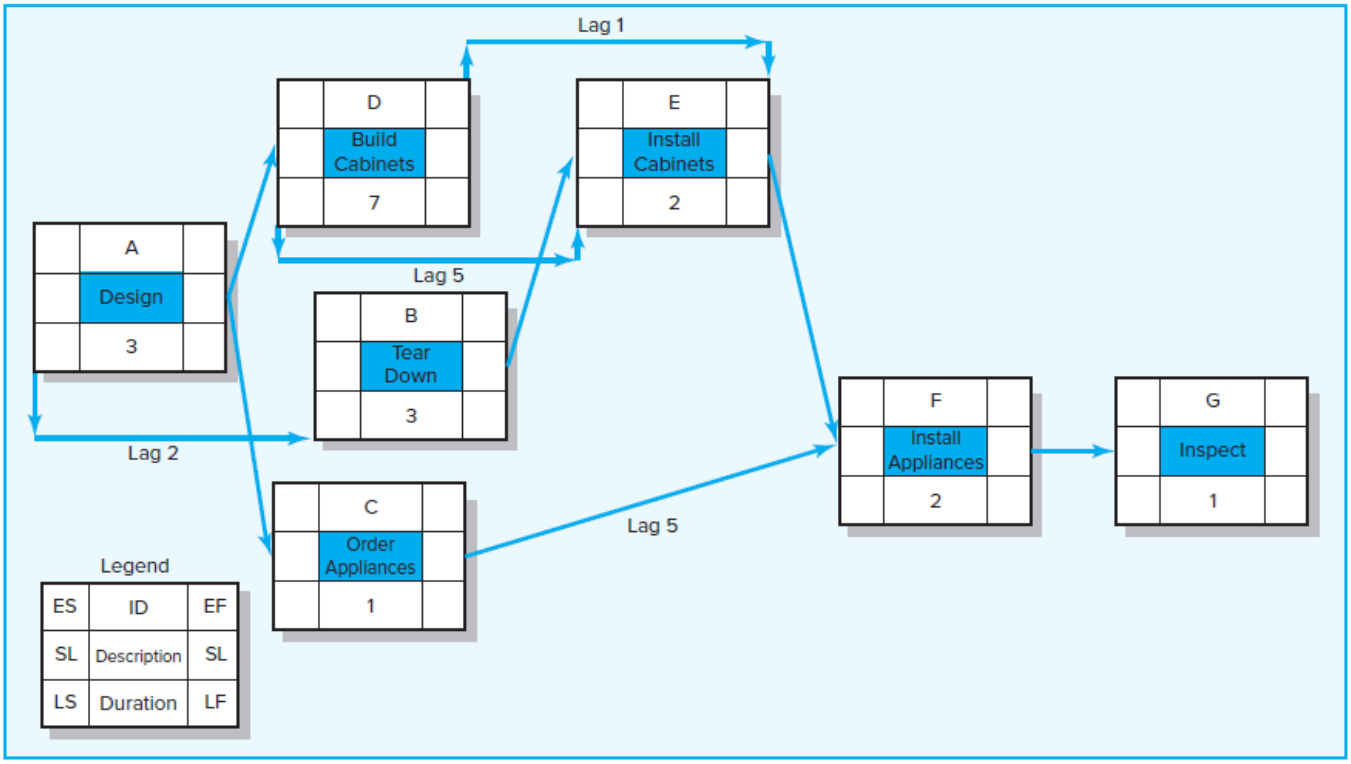
25. You are creating a customer database for the Hillsboro Hops minor league baseball team. Draw a project network given the information in the table that follows. Complete the forward and backward pass, compute activity slack, and identify the critical path. How long will this project take? How sensitive is the network schedule? Calculate the free slack and total slack for all noncritical activities.

ID	Description	Predecessor	Time (days)
A	Systems design	None	2
B	Subsystem A design	A	1
C	Subsystem B design	A	1
D	Subsystem C design	A	1
E	Program A	B	2
F	Program B	C	2
G	Program C	D	2
H	Subsystem A test	E	1
I	Subsystem B test	F	1
J	Subsystem C test	G	1
K	Integration	H, I, J	3
L	Integration test	K	1

26. You are managing a product upgrade project for Bangkokagogo. Given the project network that follows, complete the forward and backward pass, compute activity slack, and identify the critical path. Use this information to create a Gantt chart for the project. Be sure to show slack for noncritical activities.



27. Given the network below, compute the early, late, and slack time for each activity. Clearly identify the critical path.

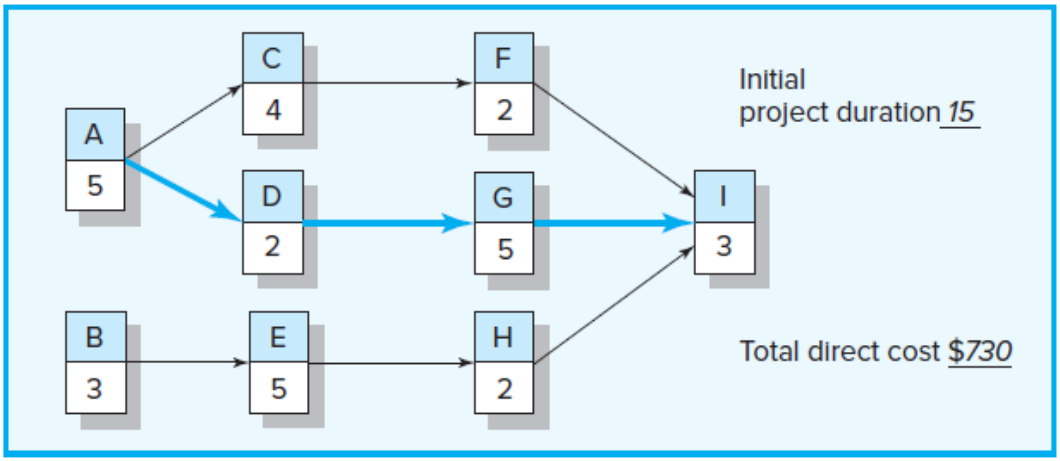


28. The expected times and variances for the project activities are given below. What is the probability of completing the project in 25 periods?

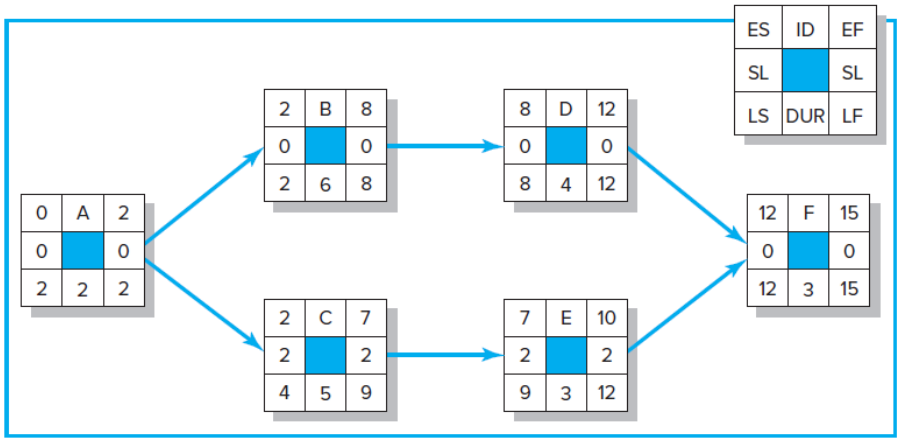
ID	Description	Predecessor	t_e	Variance $[(b - a)/6]^2$
1	Pilot production	None	6	3
2	Select channels of distrib.	None	7	4
3	Develop mktg. program	None	4	2
4	Test market	1	4	2
5	Patent	1	10	5
6	Full production	4	16	10
7	Ad promotion	3	3	2
8	Release	2, 5, 6, 7	2	1

29. Given the data and information that follow, compute the total direct cost for each project duration. If the indirect costs for each project duration are \$90 (15 time units), \$70 (14), \$50 (13), \$40 (12), and \$30 (11), compute the total project cost for each duration. What is the optimum cost-time schedule for the project? What is this cost?

Act.	Crash Cost (Slope)	Maximum Crash Time	Normal Time	Normal Cost
A	30	1	5	50
B	60	2	3	60
C	0	0	4	70
D	10	1	2	50
E	60	3	5	100
F	100	1	2	90
G	30	1	5	50
H	40	0	2	60
I	200	1	3	200
				\$730



30. Given the project network and baseline information below, complete the form to develop a status report for the project at the end of period 4 and the end of period 8. From the data you have collected and computed for periods 4 and 8, what information are you prepared to tell the customer about the status of the project at the end of period 8?



Project baseline (PV) (in $)

Task	DUR	ES	LF	SL	Budget (PV)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A	2	0	2	0	400	200	200														
B	6	2	8	0	2400			200	600	200	600	200	600								
C	5	2	9	2	1500			200	400	500	100	300									
D	4	8	12	0	1600									400	400	400	400				
E	3	7	12	2	900								300	400	200						
F	3	12	15	0	600													200	100	300	
Period PV total						200	200	400	1000	700	700	500	900	800	600	400	400	200	100	300	
Cumulative PV total						200	400	800	1800	2500	3200	3700	4600	5400	6000	6400	6800	7000	7100	7400	

End of Period 4

Task	Actual % Complete	EV	AC	PV	CV	SV
A	Finished	—	300	400	—	—
B	50%	—	1000	800	—	—
C	33%	—	500	600	—	—
D	0%	—	0	—	—	—
E	0%	—	—	—	—	—
Cumulative Totals		—	—	—	—	—

End of Period 8

Task	Actual % Complete	EV	AC	PV	CV	SV
A	Finished	—	300	400	—	—
B	Finished	—	2200	2400	—	—
C	Finished	—	1500	1500	—	—
D	25%	—	300	0	—	—
E	33%	—	300	—	—	—
F	0%	—	0	—	—	—
Cumulative Totals		—	—	—	—	—