

TIME & COST CONTROL DEFINITIONS

Things to be planned, monitored & controlled are:

- **Time (schedule);**
- **Cost (budget); and**
- **Performance (specifications)**

Cost control is:

Monitoring the costs and recording massive quantities of data and analyzing the data in order to take corrective actions before it is too late.

EARNED-VALUE SYSTEM

The earned-value system is used to monitor the progress of work and compare accomplished work with planned work.

Terms used in an earned-value analysis are:

1. Earned-Value Analysis:

BCWS = Budgeted cost of work scheduled (Planned)

ACWP = Actual cost of work performed (Actual), and

BCWP = Budgeted cost of work performed (Earned)

EARNED-VALUE SYSTEM

2. Variances:

$$CV = BCWP - ACWP,$$

(Cost variance = Earned – Actual),

$$\text{Percent cost variance} = PCV = \frac{CV}{BCWP} = \frac{BCWP - ACWP}{BCWP}$$

$$SV = BCWP - BCWS,$$

(Schedule variance = Earned – Planned)

$$\text{Percent schedule variance} = PSV = \frac{SV}{BCWS} = \frac{BCWP - BCWS}{BCWS}$$

EARNED-VALUE SYSTEM

3. Total Variance:

$$\text{Percent total variance} = \text{PTV} = \frac{\text{TV}}{\text{BCWS}} = \frac{\text{BCWS} - \text{ACWP}}{\text{BCWS}}$$

4. Indices:

$$CPI = \frac{BCWP}{ACWP} \left(\text{Cost Performance Index} = \frac{\text{Earned}}{\text{Actual}} \right)$$

$$SPI = \frac{BCWP}{BCWS} \left(\text{Schedule Performance Index} = \frac{\text{Earned}}{\text{Planned}} \right)$$

EARNED-VALUE SYSTEM

5. Forecasting:

BAC = Original project estimate

(Budget at completion)

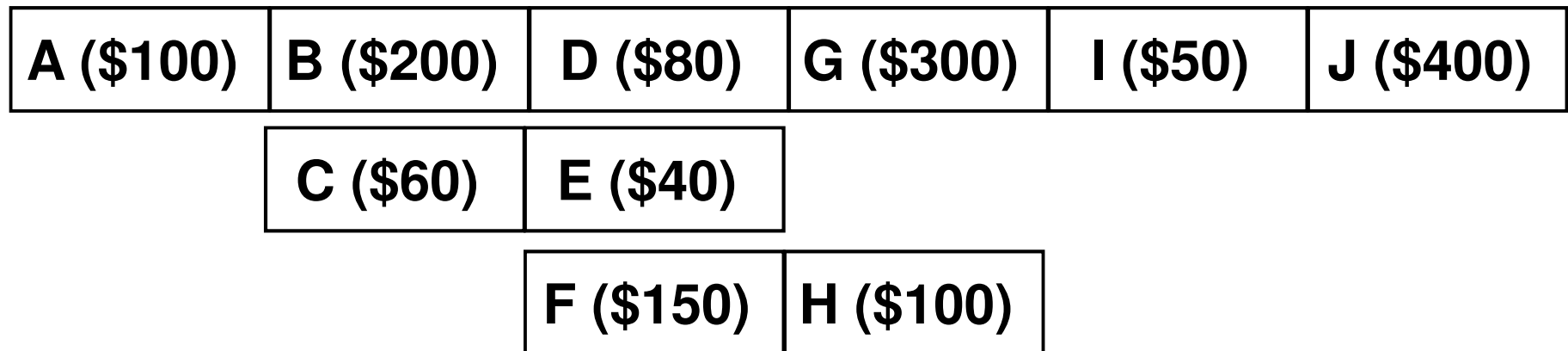
$$ETC = \frac{BAC - BCWP}{CPI} \quad (\textit{Estimate to complete})$$

$$EAC = (ACWP + ETC) \quad (\textit{Estimate at completion})$$

EXAMPLE 1

The following bar chart shows the activities to complete a project in six months, where each cell represent one month.

The total project cost is \$1,480.



EXAMPLE 1

After 3 months, activities A, B, C, E, and half of F are completed, for a cost of \$490.

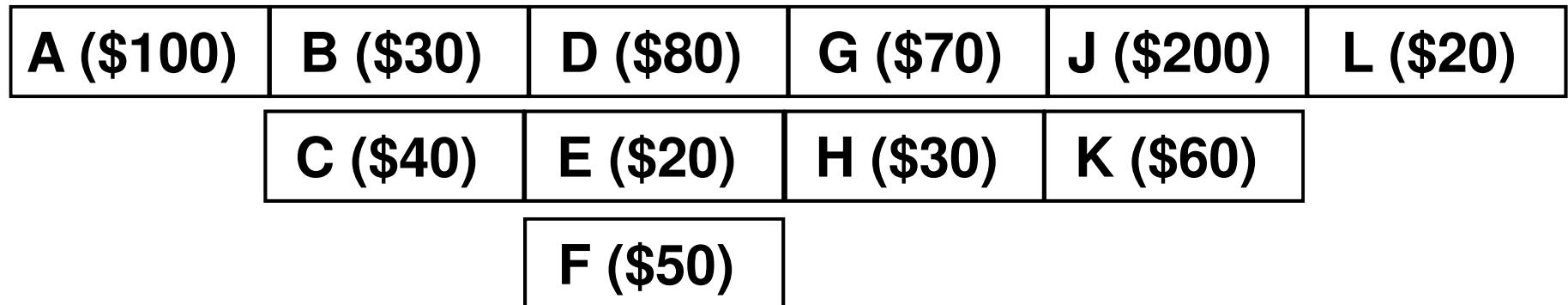
What is the status of the project in terms of budget and schedule?

Give each answer in terms of a percent variance.

EXAMPLE 2

The following bar chart shows the activities to complete a project in six months, where each cell represent one month.

The total project cost is \$700.



EXAMPLE 2

After 2 months, activities A, B, half of C, and half of D are completed, for a cost of \$200.

For this point in time (2 months after the start date), what are the values of the budgeted cost of work performed, budgeted cost of work scheduled, and the actual cost of work performed?

EXAMPLE 3

Consider a simple project in which four activities describe the basic tasks.

This project is presented here as a bar chart drawn as a time-scaled schedule.

The sum of the amounts for the activities in the schedule of values approximates the originally anticipated cost of the project.

The project duration is 4.5 months.

EXAMPLE 3

(A) 1 month | 1/2 month

(B) 1 month | (B) 1 month

(C) 1 month

(D) 1 month

The schedule values:

A - \$1,000

B - \$3,000

C - \$1,500

D - \$2,500

After 2½ months, the following has been accomplished:

EXAMPLE 3

Activity (A): 100% complete; total cost: \$ 900

Activity (B): 40% complete; cost to date: \$1,400

Activity (D): 50% complete; cost to date: \$1,500

For this project, using earned value concept, determine the schedule variance and the cost variance.

State if the project is over or under budget and if it is ahead or behind schedule.