Version 6.1 Updated for the 2021
Project Management Professional (PMP)® Exam

Crosswind Success Series: PMP® Exam Bootcamp Manual

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Tony Johnson, MBA, CAPM, PMP, PgMP, PfMP

Version 6.1 aligned with the Project Management Institute, *A Guide to the Project Management Body of Knowledge, (PMBOK® Guide)* - Sixth Edition, Project Management Institute Inc., 2017

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11.4.2. Parkinson's Law

According to Parkinson's Law, work expands to consume the time scheduled for its completion. This observation of economics was made by C. Northcote Parkinson based on his experience in the British Civil Service. He noted that as the British Empire shrank in size and significance, the colonial office staff actually increased.

Parkinson's Law can be applied to:

- Generalized situations
  The demand upon a resource expands to match the supply of the resource.
- Computer storage
  Data expands to fill the space available.
- Financial situations
  Expenses rise to meet income.

11.4.3. Schedule Processes

Figure 11-13: Overview of Schedule Processes illustrates the processes and primary artifacts of the Project Schedule Management knowledge area.

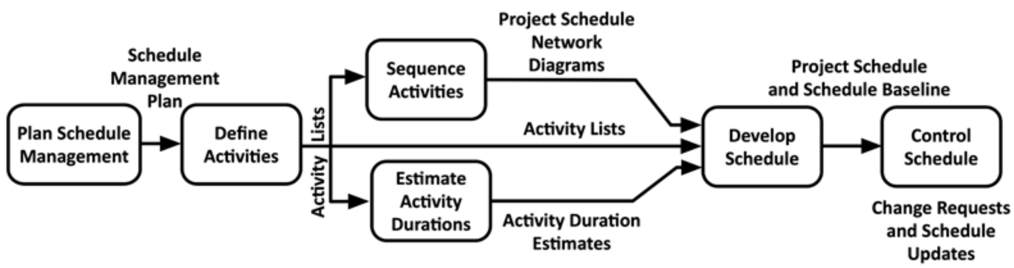

Figure 11-13: Overview of Schedule Processes

The source for the above figure is the Project Management Institute, *A Guide to the Project Management Body of Knowledge*, (*PMBOK® Guide*) – Sixth Edition, Project Management Institute Inc., 2017, Figure 6-1, Page 174

The processes in sections 11.1, 11.2, 11.3, and 11.4 lead to the development of the project schedule and establishment of the schedule baseline.

The source for the above text is the Project Management Institute, *A Guide to the Project Management Body of Knowledge*, (*PMBOK® Guide*) – Sixth Edition, Project Management Institute Inc., 2017, Pages 195-204

11.5. Develop Schedule (Planning Process Group)

During the Develop Schedule process, the creation of activity lists, the sequencing of activities, and the estimation of activity durations all come together to create the project schedule.

Note that on smaller projects, Define Activities, Sequence Activities, Estimate Activity Resources (EAD), and Develop Schedule may occur as a single overall process.

Know the Develop Schedule concepts. Know the Key Inputs, Tools & Techniques, and Outputs for Develop Schedule.

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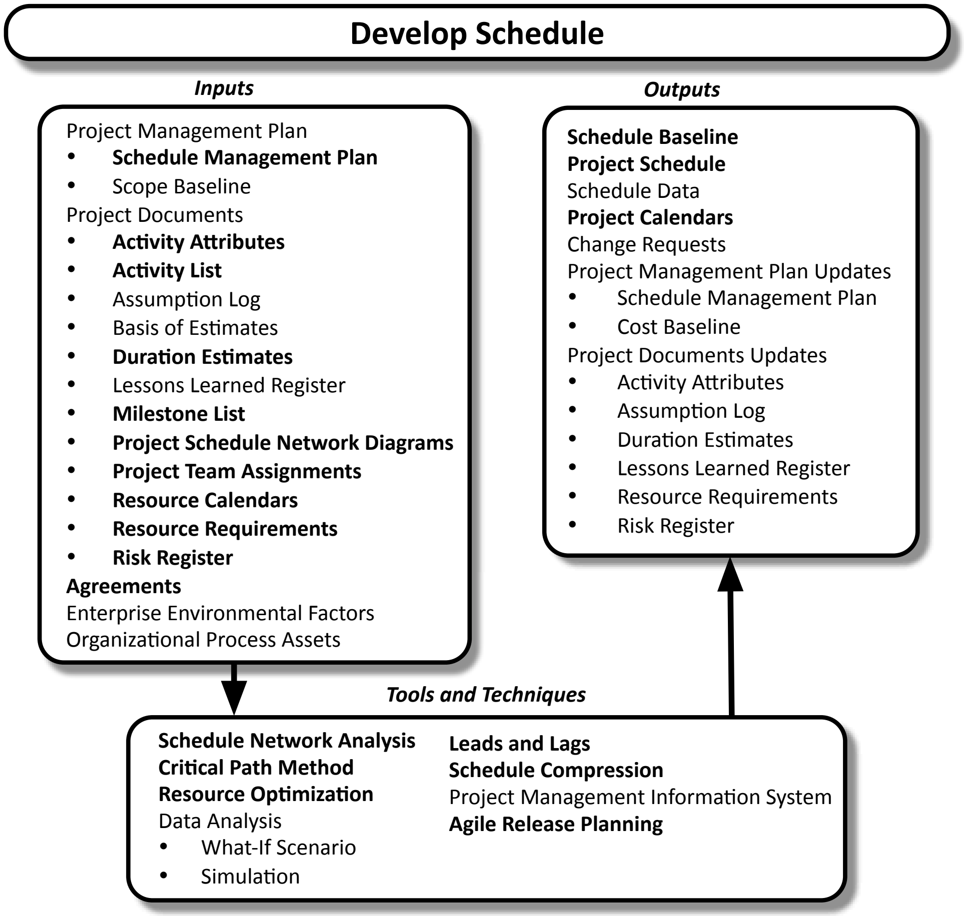

Figure 11-14: Develop Schedule Data Flow Diagram

The source for the above figure is the Project Management Institute, *A Guide to the Project Management Body of Knowledge*, (*PMBOK® Guide*) – Sixth Edition, Project Management Institute Inc., 2017, Figure 6-14, Page 205

Develop Schedule (Planning)		
Key Inputs	Schedule Management Plan	The schedule management plan is a component of the project management plan that details the delineation, evolution, monitoring, and control of the schedule. It delineates scheduling methodology, the degree of expected accuracy needed to estimate the duration of the scheduled activities, the mechanism used to produce the schedule, and the manner in which the schedule will be calculated.

Develop Schedule (Continued)		
Key Inputs (Cont.)	Activity Attributes	Activity attributes clarify an activity by identifying multiple components related to the activity. The components evolve during the project: during the initial stage, they include a singular activity identifier, a WBS identifier, and an activity label; when completed they typically include a description of the activity, predecessor and successor activities, logical relationships, leads and lags, resource needs, constraints, assumptions, and exact dates. They are used to create the schedule model.
	Activity List	The activity list enumerates the activities included in the schedule model.
	Duration Estimates	Duration estimates are quantitative estimates of activity durations in which lags are not considered. They are often expressed as a range of time or a probability of reaching a specific duration.
	Milestone List	The milestone list enumerates the most consequential points or events in the project and indicates if the milestone is required or optional. A milestone has a duration of zero. If the milestone has been assigned a specific date, it typically impacts the manner in which activities are scheduled.
	Project Schedule Network Diagrams	Project schedule network diagrams illustrate the dependencies (logical relationships) between project schedule activities. They can be high-level or detailed and include a summary narrative delineating the basic approach to activity sequencing and detailing unusual sequences. Activities with multiple predecessor or successor activities should note a path convergence (predecessor activities), since these have greater risk.
	Project Team Assignments	Project team assignments delineate the resources that are assigned to an individual activity.
	Resource Calendars	Resource calendars delineate project resource accessibility.
	Resource Requirements	Resource requirements delineate the classes and numbers of resources that are needed for individual activities utilized in the schedule model. Note that resources are not limited to people, but include items such as equipment and office space.

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Develop Schedule (Continued)		
Key Inputs (Cont.)	Risk Register	The risk register delineates all identified risks that impact the schedule model and their characteristics. The information is used to establish schedule reserves.
	Agreements	Agreements, sometimes referenced as contracts or vendor agreements, may impact the schedule as the vendors delineate how they will perform the work detailed in the agreement.
Key Tools & Techniques	Schedule Network Analysis	Schedule network analysis is the designation used to describe the techniques utilized to create the schedule model. The analysis typically includes critical path analysis, modeling techniques, and techniques to increase the effectiveness of resources. It may also include, among other pertinent analysis techniques, a network review to determine any risks that might engender schedule slippage and an analysis regarding the efficacy of aggregating schedule reserves to offset schedule slippage.
	Critical Path Method	The critical path method is a schedule network analysis technique that establishes the amount of flexibility (slack) on network paths (the sequence of activities) within the schedule model. The critical path is the longest path through the project and represents the minimum project duration. The method uses forward and backward pass approaches to calculate the early start, early finish, late start, and late finish dates of each activity to establish slack for each activity. It is typically used with Precedence Diagram Method sequencing.
	Resource Optimization	Resource optimization uses techniques, such as resource leveling and resource smoothing, to adjust the schedule to accommodate resource availability. Resource leveling is accomplished by adjusting start and finish dates to offset resource demand with resource supply. Resource smoothing is accomplished by using an activity's float to offset resource demand with resource supply. These techniques can also be used to schedule a consistent level of hours (usually either daily or weekly) for project resources.
	Leads and Lags	A lead is the amount of time that a successor activity will be started before a predecessor activity is completed. A lag is the amount of time that a successor activity will be delayed after the predecessor activity is completed.

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Develop Schedule (Continued)		
Key Tools & Techniques	Schedule Compression	Schedule compression is utilized to decrease the duration of the project schedule without decreasing its scope. Techniques include crashing, decreasing the schedule duration by increasing resources for activities on the critical path, and fast tracking, decreasing the schedule duration by performing activities or phases at the same time, instead of in sequence, for at least a part of their duration.
	Agile Release Planning	Agile release planning creates a high-level timeline of the release schedule for the next three to six months in accordance with the product roadmap. The number of iterations or sprints in the release is determined during planning so decisions can be made regarding the extent of product development and the length of time required to release the product. The customer typically finds the timeline more understandable than the project schedule since it exhibits the features that will be functional as a result of each iteration.
Key Outputs	Schedule Baseline	The schedule baseline is the authorized version of the schedule model. It contains baseline start and baseline finish dates, is subject to change control, and is used as the basis of comparison to actual results.
	Project Schedule	The project schedule is the product of a schedule model containing linked activities and their planned dates, durations, milestones, and resources. It is usually formatted as a bar chart, milestone chart, or project schedule network diagram, although tabular formatting may occur. Until resources have been allocated and start and finish dates substantiated, the project schedule is preliminary. A master schedule or milestone schedule is a summary form of the project schedule.
	Project Calendars	A project calendar is created to depict working days and shifts for scheduled activities based on resource availability. To determine the project schedule, more than one calendar might be used to accommodate different work periods for particular activities.

Situational Question and Real World Application

Failure to effectively perform the Develop Schedule process can result in not knowing when activities should occur. If resources are not addressed appropriately, misallocation of resources can result. If duration estimates are significantly out of alignment, problems associated with schedule slippage can occur.

11.5.1. Schedule Examples

There are a variety of schedule formats. The most common formats are activity lists, bar charts, and network diagrams.

Activity lists contain all required schedule activities for the project, an identifier for each activity, and a rather detailed scope of work description for each activity. **Bar charts** are an easy to read representation of schedule activities (bars) and denote the start date, end date, and duration of each activity. **Network diagrams** are visual representations of network logic and scheduling. Typically, the diagrams contain date information for critical path activities and are formatted as activity-on-node or logic bar chart.

11.5.2. Schedule Baseline

A schedule baseline is a specific version of the project schedule that is selected and approved by the project management team as the baseline and includes baseline start and finish dates.

11.5.3. Critical Path Method (CPM)

Know how to recognize a critical path and why it is important.

The critical path method utilizes a forward pass to establish the earliest start (ES) and finish (EF) dates for activities and a backward pass to establish the latest start (LS) and finish (LF) date for activities.

Determining this information for each path and activity allows the calculation of the critical path and the amount of slack (float) on each activity as well. Any activity on the critical path typically has zero slack (float), but there can be negative slack (float) if the project is behind schedule.

In most cases, the activities on the critical path are the ones that should receive the most focus and attention from the project manager.

11.5.4. Slack (Also Known as Float)

Know the characteristics of free slack (free float), total slack (total float), and project slack (project float).

Slack (float) is the amount of time that an activity can slip or be delayed without delaying the finish date of the project (or activity or published project completion date). Typically, slack (float) is calculated using a forward and backward pass.

If an activity has no slack (float), it is on the critical path; therefore, if it slips, it pushes out the finish date.

Negative or positive slack (float) can also exist, extending or contracting the actual finish date of the project. For example, if a project finishes two weeks early, there are two weeks of positive slack (float). If the project finishes two weeks late (without approval of a new date), there are two weeks of negative slack (float).

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Slack (Float) Type	Description
Free Slack	Free slack (float) involves determining the latest that an activity can start without delaying the activities that follow it.
Total Slack	Total slack (float) is the latest an activity can start without delaying the project finish date.
Project Slack	Project slack (float) is the amount of time something can be delayed without delaying the published finish date. Most scheduling software will calculate these dates for you.

The concepts needed for the exam, which focus on total slack (float), follow.

11.5.5. Critical Path

The critical path is the **longest path on the project network diagram.** It typically has no slack (float), yet the duration can change as the project evolves. The greatest project risk normally occurs on the critical path.

Know the concepts of CPM (critical path method) estimation.

The project end date can be delayed if an activity on the critical path has a problem. The increase or slippage of an activity on the critical path can cause the overall finish date to slip.

A project has **negative slack (float) if it is behind schedule and a new finish date has not been authorized.**

A project can have multiple critical paths, but that would increase the risk of schedule slippage.

11.5.6. How to Calculate the Critical Path

The following table represents a data table typically found on the exam. It is used to create a network diagram and then determine the critical path.

Activity	Preceding Activities	Duration in Days
A	Start	4
B	Start	5
C	A	4
D	B	2
E	C, D	6
F	D	1
G	E, F	5

When the project starts, Activity A (4 days) and B (5 days) can begin. When Activity A is done, Activity C (4 days) can begin. When Activity B is done, Activity D (2 days) can begin. Activities C and D must finish before Activity E (6 days) can begin. Activity F (1 day) can begin when Activity D is complete. Activity G can begin when Activities E and F are complete. When Activity G (5 days) is complete, the project is complete.

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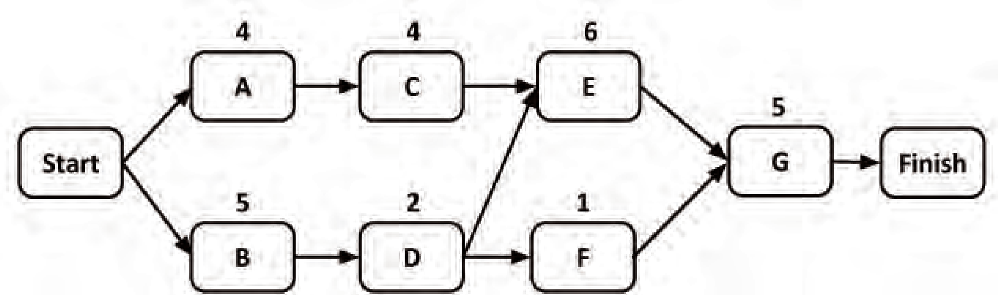

Figure 11-15: Network Diagram for Critical Path Analysis

The source for the above figure is the Project Management Institute, *A Guide to the Project Management Body of Knowledge*, (*PMBOK® Guide*) – Sixth Edition, Project Management Institute Inc., 2017, Figure 6-11, Page 193

Paths: ACEG = 19 BDEG =18 BDFG = 13

The critical path is the path that is the longest. That is path ACEG with a total of 19 days.

Note the following for the exam:

- For word problems related to network diagrams, draw the network diagram and then double check connections, activity labels, and activity durations
- List all paths and calculate the duration of each path using the top to bottom approach (list the paths as they start at the top of the diagram and work toward those on the bottom so you don't miss anything)
- Determine the critical path by selecting the longest (duration) path

11.5.7. Forward and Backward Pass Calculation

A forward and backward pass calculation is a standard calculation used to determine the critical path of the network diagram, the amount of slack (float) for each activity, and the amount of total slack (float).

- Slack (float) defines the amount of time an activity can slip before delaying the next activity
- Total slack (float) defines the amount of time an activity can slip before it delays the project finish date.

Mnemonics (memory tools) for the steps needed to perform a forward pass and a backward pass are **FIB** and **BDS**.

- **FIB** is the mnemonic for **Forward: Increment** (one day to another between activities) and choose the **Bigger** of all Early Finish (EF) dates feeding into an Early Start (ES) for the next activity
- **BDS** is the mnemonic for **Backward: Decrement** (one day to another between activities) and choose the **Smaller** of all Late Starts (LS) feeding into the Late Finish (LF) of the next activity

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The **forward pass** starts at the start (left) of the network diagram and works through to the finish establishing the Early Start (ES) and Early Finish (EF) of the activities.

The **backward pass** starts at the finish and works backward to the left of the diagram establishing the Late Finish (LF) and Late Start (LS) of the activities.

Note that there are two approaches to a forward/backward pass: counting from day zero or counting from day one. Crosswind uses the day one approach, but either approach will work, so Crosswind has created a downloadable file that recreates sections 11.5.7 through 11.5.9 using the day zero approach. That file is located at http://www.crosswindpm.com/download/crosswindpmpday0.pdf.

Forward Pass Purpose	Provides the early start (ES) and early finish (EF) dates of each activity on the network diagram
Forward Pass Formula	ES + Duration - 1 = EF
Assumptions	A day starts at 8:00 a.m. and finishes at 5:00 p.m.
Starting Point	At the left of the network diagram, typically the start activity
Variables	**Early start (ES)** - The earliest an activity can start based on network diagram logic **Early finish (EF)** - The earliest an activity can finish based on network diagram logic **Duration** - The length of an activity **Convergence** - Where the output of more than one activity is a predecessor to an activity on the network diagram

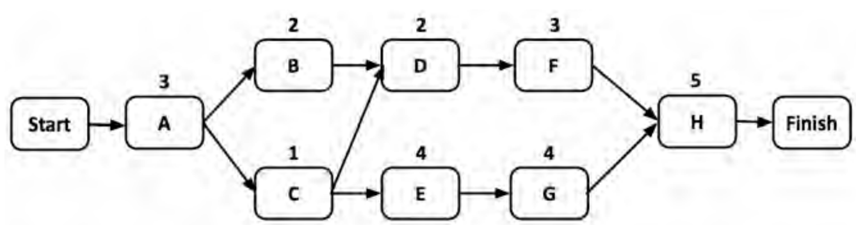

Figure 11-16: Network Diagram for Critical Path Analysis

The source for the above figure is the Project Management Institute, *A Guide to the Project Management Body of Knowledge*, (*PMBOK® Guide*) – Sixth Edition, Project Management Institute Inc., 2017, Figure 6-16, Page 211

Chapter 11
Schedule

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Instructions for the Performance of a Forward Pass

Read the section below at least once, then perform the following steps referencing figure 11-16: Network Diagram for Critical Path Analysis.

1. Set the early start (ES) of Activity A to one (the first day of the project).
2. Apply the forward pass formula (EF = ES + Duration - 1) to the network diagram activity-by-activity from start to finish. As you move from one activity to another, increment the early finish (EF) of the current activity by one to give you the early start (ES) of the next activity. For example, Activity A has an early finish (EF) of 3; the early start (ES) of the following activity is 4.
If you encounter a convergence (reference step 3), return to the beginning of the diagram and continue this step for all activities leading into the convergence.
3. Wherever you encounter a convergence, select the larger of the early finish (EF) values and continue applying the forward pass formula from start to finish on the network diagram.
4. Perform steps 2 and 3 until you have applied the forward pass formula to all activities. The forward pass is complete at this point. The network diagram should also be complete.

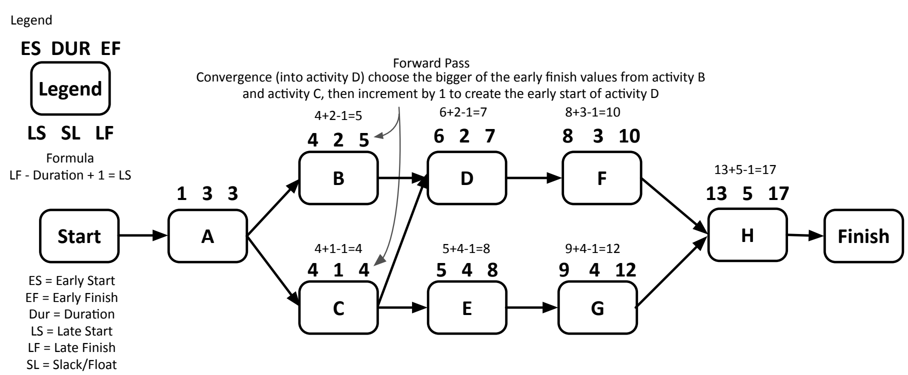

Figure 11-17: Forward Pass Calculation Description

The source for the above figure is the Project Management Institute, *A Guide to the Project Management Body of Knowledge*, (*PMBOK® Guide*) – Sixth Edition, Project Management Institute Inc., 2017, Figure 6-16, Page 211

Note that the calculations are not part of a typical diagram but are shown for clarification.

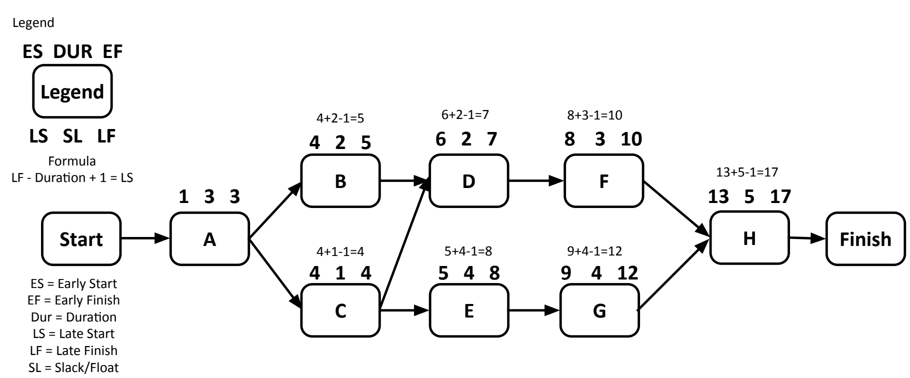

Figure 11-18: Forward Pass

The source for the above figure is the Project Management Institute, *A Guide to the Project Management Body of Knowledge*, (*PMBOK® Guide*) – Sixth Edition, Project Management Institute Inc., 2017, Figure 6-16, Page 211

Backward Pass Purpose	Provides the late start (LS) and late finish (LF) dates of each of the activities on the network diagram
Backward Pass Formula	LF - Duration + 1 = LS
Variables	**Late start (LS)** - The latest an activity can start based on the network diagram logic **Late finish (LF)** - The latest an activity can finish based on the network diagram logic **Duration** - The length of an activity **Burst** – Where an activity has multiple outputs that are predecessors to more than one activity
Assumptions	A day starts at 8:00 a.m. and finishes at 5:00 p.m.
Starting Point	At the right of the network diagram, typically the finish or end activity

Instructions for the Performance of a Backward Pass

1. The late finish (LF) is the same as the early finish (EF) on the last activity (also, the duration of the critical path). If the network diagram ends with multiple activities, the Late Finish (LF) for all is the greatest Early Finish (EF).
2. Apply the backward pass formula (LF - Duration + 1 = LS) from the finish (right) to the start (left) of the network diagram. As you move from one activity to another, decrease the late start (LS) by one to give you the late finish (LF) of the next activity. For example, Activity H has a late start (LS) of 13; the activity that precedes it has a late finish (LF) of 12.
If you encounter a burst (see Backward Pass Calculation Description in this step), return to the finish (right) of the diagram and continue this step for all activities leading (from the right to the left) into the burst.

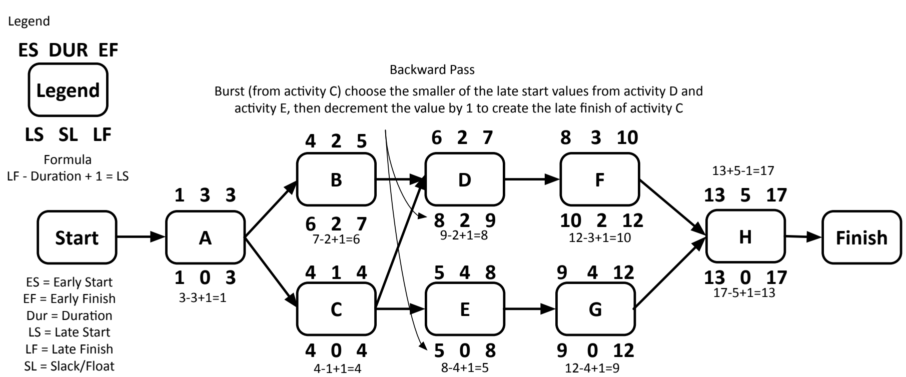

Figure 11-19: Backward Pass Calculation Description

The source for the above figure is the Project Management Institute, *A Guide to the Project Management Body of Knowledge*, (*PMBOK® Guide*) – Sixth Edition, Project Management Institute Inc., 2017, Figure 6-16, Page 211

3. At any burst on the network diagram, select the smaller of the late start (LS) values.
4. Perform steps 2 and 3 until all activities are done. At this point, the network diagram should resemble Figure 11-20: Backward Pass.

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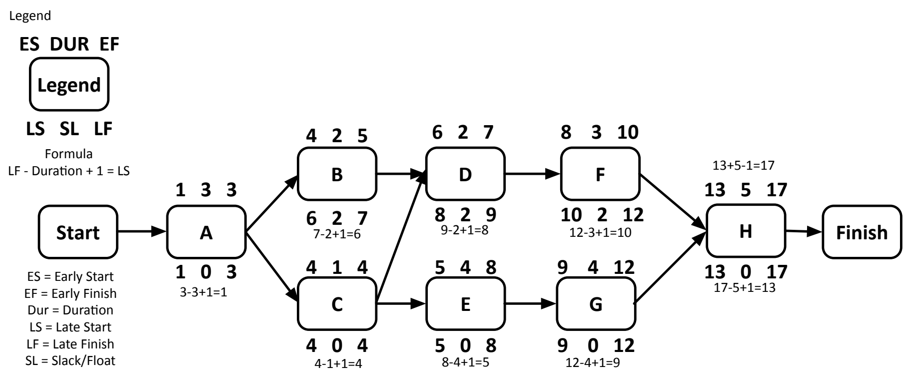

Figure 11-20: Backward Pass

The source for the above figure is the Project Management Institute, *A Guide to the Project Management Body of Knowledge*, (*PMBOK® Guide*) – Sixth Edition, Project Management Institute Inc., 2017, Figure 6-16, Page 211

Critical Path: The critical path is the longest path in the network diagram. Any activities on the critical path have an early start and late start that are the same value, as well as an early finish and late finish that are the same value. They have zero slack (float), meaning that if any of the activities slip, the overall project finish date slips as well.

11.5.8. Instructions for the Performance of a Forward and Backward Pass Substitute Technique

Know how to do a forward pass and a backward pass substitute technique on a network diagram.

To calculate the slack (float) of a path (or activity), without having to do the traditional forward/backward pass approach, do the following:

1. Add the durations of all paths and list them in the format "path name and total duration."
2. List each activity (A =, B=, etc.) to later list the slack of each activity after the equal sign.
3. Identify the critical path of the network diagram. This is the path with the longest duration.
4. Put 0 (zero) for slack (float) for each activity on the critical path.
5. On the next longest path, subtract that overall duration from the critical path duration (for example, 1-day difference).
6. Any activity from that path that does not already have a slack (float) number on it, put the difference (for example, 1 day) from step four as slack (float) for those activities.
7. Repeat steps five and six until all activities have slack (float) numbers.

If the path under review is not at the end of the diagram, you can still use this method. Other methods show subtracting all the activities one by one until you have the slack (float) value you are calculating for. You need to do that method only if you must calculate an early start or early finish of an activity. The next paragraph covers calculation of the early/late start and finishes.

11.5.9. Network Diagram Analysis

The Network Diagram (Figure 11-21: Network Diagram Analysis) contains the arrows and formulas necessary for the calculation of duration or slack (float). The relevant formulas are listed in the diagram and the diagram arrows point in the starting direction. Note that if an activity is on the critical path, the slack (float) is zero.

Instructions for Using the Alternative Method to Calculate the Slack (Float) of an Activity

Use the formula LF - EF (late finish - early finish) or LS - ES (late start - early start) to calculate the slack (float) of an activity by using the date provided in the exercise. If the difference is zero, the activity is on the critical path. If the value is negative, the activity has negative slack (float); if the value is positive, the activity has positive slack (float).

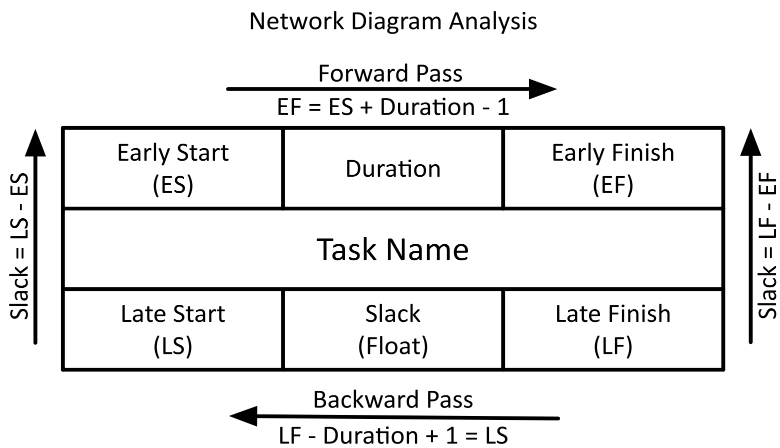

Figure 11-21: Network Diagram Analysis

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11.5.10. Schedule Compression Techniques

If it is necessary to compress the schedule (usually to achieve a more aggressive time goal), the two main techniques are **crashing** and **fast tracking**. Schedule compression may employ either or both techniques.

Crashing is the application of additional resources (human) to the critical path items, excluding any resequencing activities.

Fast tracking is the analysis of the network diagram and activity sequencing to determine the sequencing adjustments that will accelerate the completion of work. Fast tracking does include the risk exposure associated with the resequencing.

Instructions for Fast Tracking

Figure 11-22: Network Diagram Pre-fast Tracking has two paths: the first path is A, B, D, E, F with a total duration of 13 and the second path is A, C, D, E, F with a total duration of 12. Path A, B, D, E, F is the critical path because it is the longer of the two paths.

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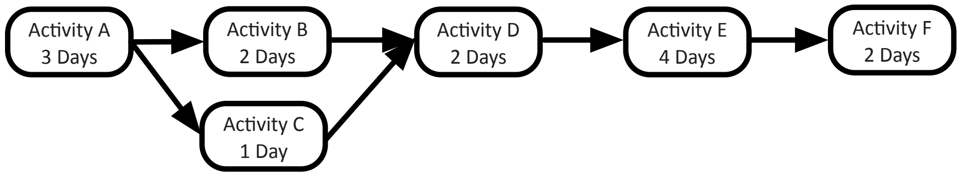

Figure 11-22: Network Diagram Pre-fast Tracking

The source for the above figure is the Project Management Institute, *A Guide to the Project Management Body of Knowledge*, (*PMBOK® Guide*) – Sixth Edition, Project Management Institute Inc., 2017, Figure 6-19, Page 215

To compress the overall duration using the fast tracking technique, resequence the diagram in Figure 11-23: Network Diagram Post-fast Tracking. Path A, B, D, F has a total duration of 9. Path A, B, E, F has a total duration of 11 and path A, C, D, F has a total duration of 8. Path A, B, E, F is the critical path because it is the longest of the three paths. Fast tracking has reduced the critical path from 13 (the original sequencing) to 11 (the revised sequencing).

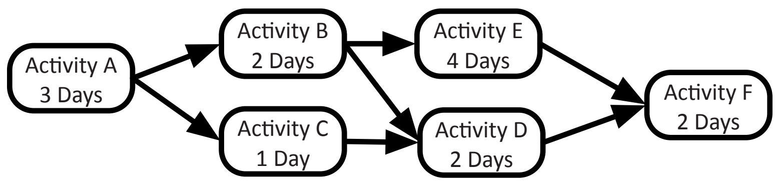

Figure 11-23: Network Diagram Post-fast Tracking

The source for the above figure is the Project Management Institute, *A Guide to the Project Management Body of Knowledge*, (*PMBOK® Guide*) – Sixth Edition, Project Management Institute Inc., 2017, Figure 6-19, Page 215

Characteristics of both are listed in the following table.

Technique	Characteristics			
	Key	Cost	Quality	Additional
Crashing	**Putting more resources** on critical path activities	Usually increases cost	Minimal risk exposure (Compared to fast tracking)	Requires more people than originally planned.
Fast Tracking	**Doing activities in parallel** that are normally in sequence	Flexible, but may increase cost from potential rework	Additional risk exposure due to possible rework	Can require additional communication to coordinate activities

Understand the characteristics and benefits of "crashing" and "fast tracking."

11.5.11. Resource Leveling

As the schedule is created, resources are assigned often resulting in a pattern of peaks and valleys as depicted in Figure 11-24: Resource Allocation (Pre-leveling). These peaks and valleys represent resources that can be applied for 12 hours one day but only four hours the next. It is possible to considerably soften the peaks and valleys, reference Figure 11-25: Resource Allocation (Post-leveling), by applying resource leveling. Note that applying resource leveling to the schedule often results in an overall finish date later than originally scheduled.

Resource leveling and schedule compression techniques are typically used together in several iterations to attain an optimal balance between delivery deadlines and resource utilization.

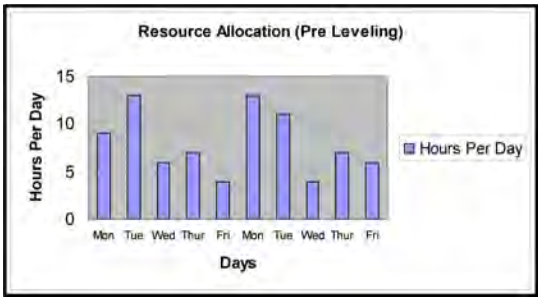

Figure 11-24: Resource Allocation (Pre-leveling)

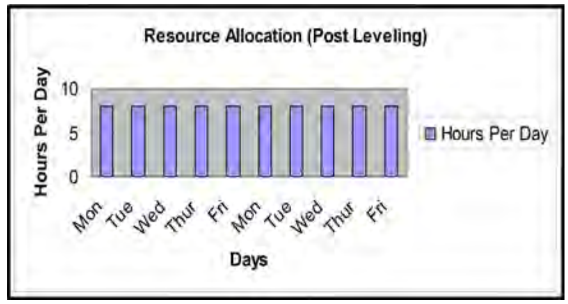

Figure 11-25: Resource Allocation (Post-leveling)

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11.5.12. Resource Smoothing

Resource smoothing is similar to resource leveling in that it also removes peaks and valleys. The difference is that the focus of resource smoothing is on predefined resource limits (for example, resource A is limited to working six hours daily) **rather than merely preventing over-allocation** of resources.

11.5.13. Logic Bar Chart

Know the characteristics of a logic bar chart.

A logic bar chart, sometimes called a Gantt chart, is a common chart **used to track the day-to-day details of the project.** It contains a table of information (usually activities, dates, resources, etc.) on the left and horizontal bars showing when those activities occur on the right. It may also have vertical lines that connect the horizontal bars, which are typically used to indicate a project phase. Although the logic bar chart depicts sequencing, the network diagram is the preferred tool for viewing the sequence of activities.

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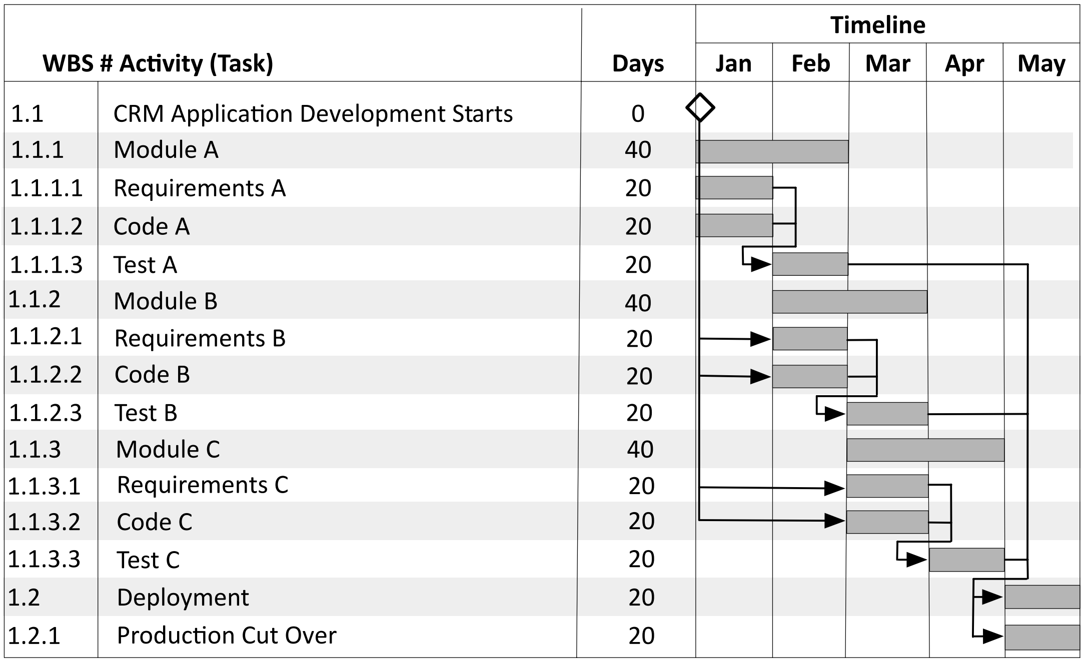

Figure 11-26: Logic Bar Chart Sample

The source for the above figure is the Project Management Institute, *A Guide to the Project Management Body of Knowledge*, (*PMBOK® Guide*) – Sixth Edition, Project Management Institute Inc., 2017, Figure 6-21, Page 219

11.5.14. Milestone Schedule

The milestone schedule is **typically used in executive reporting**, and each milestone has a **zero (0) duration.** It lacks detail, generally listing only the main project milestones as diamonds instead of Gantt bars. Like the logic bar chart, the milestone schedule does not require lines connecting the milestone diamonds.

Executives usually don't require much detail, so the milestone schedule fits their needs. Because project teams require more detail, they typically use Gantt charts.

> Know the characteristics of a milestone schedule. A common misunderstanding about a milestone is the duration. This is something you should know for the exam. A milestone has 0 (zero) duration.

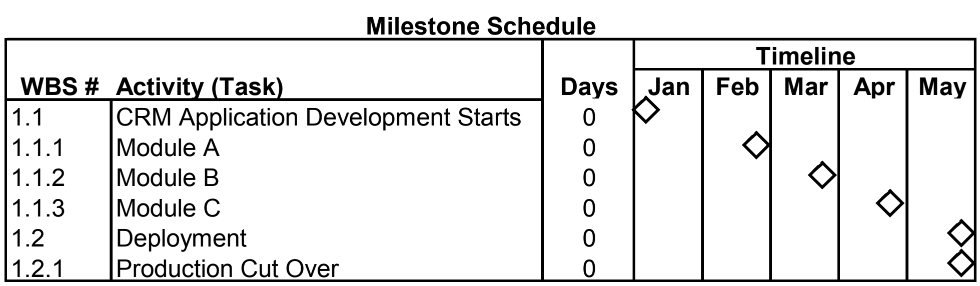

Figure 11-27: Milestone Schedule Sample

The source for the above figure is the Project Management Institute, *A Guide to the Project Management Body of Knowledge*, (*PMBOK® Guide*) – Sixth Edition, Project Management Institute Inc., 2017, Figure 6-21, Page 219

11.5.15. Summary Schedule

The summary schedule shows an aggregate or rolled up view of the various activities at a summary level. It gives senior management, the project management team, and team members a picture of how long the summary level work packages will take, and in what sequence they will occur.

Know the characteristics of a summary schedule.

WBS #	Activity (Task)	Days	Timeline: Jan	Feb	Mar	Apr	May
1.1	CRM Application Development Starts	100					
1.1.1	Module A	40					
1.1.2	Module B	40					
1.1.3	Module C	40					
1.2	Deployment	20					
1.2.1	Production Cut Over	20					

Figure 11-28: Summary Schedule Sample

The source for the above figure is the Project Management Institute, *A Guide to the Project Management Body of Knowledge*, (*PMBOK® Guide*) – Sixth Edition, Project Management Institute Inc., 2017, Figure 6-21, Page 219

11.5.16. Hammock Activity

A hammock activity is a summary activity that encompasses all of the tasks or activities underneath it. The summary or hammock activity starts at the earliest start date of the activities encompassed and finishes at the latest finish date of the activities encompassed. For example, in Figure 11-28, Summary Schedule Sample, Module A, Module B, and Module C are part of the hammock activity CRM Application Development Starts. The hammock activity is scheduled to start in January and end before May.

11.5.17. Agile Release Planning

The coach/facilitator facilitates the release planning meeting. The team and the product owner/customer attend this meeting. The team selects the user stories/requirements to be included in the release based primarily on product owner/customer prioritization. The team typically places the user stories/requirements, listed on sticky notes, on a white board. The team then divides the release, or designated unit of calendar time, into iterations. It is very important that all team members, even those that are not co-located, participate in this meeting.

The source for the above text is the Project Management Institute, *A Guide to the Project Management Body of Knowledge*, (*PMBOK® Guide*) – Sixth Edition, Project Management Institute Inc., 2017, Pages 205-221

11.6. Control Schedule (Monitoring and Controlling Process Group)

During the Control Schedule process, changes to the schedule are managed and controlled.

Know the Control Schedule concepts. Know the Key Inputs, Tools & Techniques, and Outputs for Control Schedule.

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