1) A list of activities, precedence relations, and optimistic, most likely, and pessimistic activity completion times for a project are as given below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Activity Name | Predecessor Activities | Optimistic | Most Likely | Pessimistic |
| A | - | 4 | 5 | 6 |
| B | A | 3 | 4 | 8 |
| C | B | 1 | 2 | 3 |
| D | A, C | 3 | 6 | 8 |
| E | D | 7 | 8 | 9 |
| F | E | 4 | 5 | 7 |
| G | C | 3 | 4 | 5 |
| H | D, E, G, I | 12 | 13 | 15 |
| I | C | 1 | 2 | 4 |
| J | G, H | 1 | 1 | 1 |
| K | F, H, J | 1 | 6 | 7 |

a) Draw an AOA network diagram for this project.

b) What is the expected completion time for each activity in the project?

c) What is the variance associated with the expected completion time of each activity in the project?

d) What is the critical path for the project?

e) What is the expected completion time of the project?

f) What is the variance of the expected completion time of the project?

g) What is the probability that the project will be completed in 48 days, 45 days, and 42 days?

Part b: Using the data in problem 1), answer the following questions; use the most likely time as an estimate of the activity times in these questions.

a) Draw an AON network diagram.

b) Compute the early start (ES), late start (LS), early finish (EF), and late finish (LF) and slack times of each activity in the network.

c) What is the critical path? What is the expected completion time for the project?