# Section I

*Use the diagram below answer the questions in this section. Assume all activities require the same type of resource (e.g. a programmer) and that there is a maximum of only 6 resources available for this project. Also assume the project starts at time zero and each duration unit equals one day. Use the scheduling heuristics provided to develop a resource-constrained schedule.*



1. What is the project duration for the resource-constrained schedule? (Write only the number; do not write units, such as weeks.) (10 pts.)
2. How many working days (duration units) will pass in the schedule before activity D is completed in the resource-constrained schedule? (5 pts.)
3. How many working days (duration units) will pass in the schedule before activity G is completed in the resource-constrained schedule? (5 pts.)
4. Which activities are impacted (i.e. require a change to the activity’s start or finish time) by the resource constraints? (10 pts.)

# Section II

*Use the table below answers the questions in this section. Assume only 1 carpenter and 1 painter is available.*

|  |  |  |  |
| --- | --- | --- | --- |
| Activity | Duration (days) | Predecessor | Required Resource |
| A\* | 3 | None | 1 carpenter |
| B | 4 | A | 1 carpenter |
| C | 3 | B | 1 carpenter |
| D | 4 | B | 1 carpenter |
| E | 5 | C, D | 1 painter |
| F | 2 | D | 1 painter |
| G | 5 | E, F | 1 carpenter |
| H | 3 | G | 1 carpenter |

\*Assume zero as the early start (ES) time for activity A

1. Which activities are on the critical path in the unconstrained project? (5 pts.)
2. What is the duration of the unconstrained project? (Write only the number; do not write units, such as days.) (5 pts.)
3. What is the project duration for the resource-constrained schedule? (Write only the number; do not write units, such as days.) (10 pts.)
4. Which activities are impacted (i.e. require a change to the activity’s start or finish time) by the resource-constrains? (10 pts.)

# Section III

*Use the time-phased work packages and network provided below to answer the questions in this section. Assume the project starts at time zero and each duration unit equals one day.*



|  |  |
| --- | --- |
|  | Cost by Day |
| ID | 1 | 2 | 3 | 4 | 5 | 6 |
| A | 25 | 25 |  |  |  |  |
| B | 100 |  |  |  |  |  |
| C | 50 |  |  |  |  |  |
| D | 75 | 25 |  |  |  |  |
| E | 100 | 200 | 300 | 400 |  |  |
| F | 100 | 200 | 300 | 300 | 200 | 100 |
| G | 150 | 150 |  |  |  |  |
| H | 200 | 200 | 100 | 100 |  |  |
| I | 50 | 50 |  |  |  |  |

1. Scheduling all activities based on their ES and EF times, what is the cumulative budget for day 3 of the project? (10 pts.)
2. Scheduling all activities based on their ES and EF times, what is the dollar amount budgeted for only day 7 of the project? (10 pts.)
3. Scheduling all activities based on their LS and LF times, what is the cumulative budget for day 5 of the project? (10 pts.)
4. Scheduling all activities based on their LS and LF times, what is the dollar amount budgeted for only day 10 of the project? (10 pts.)