**BCSS with 2 BCSs and 11 BSSs**

**TABLE I Data of BSSs and BCSs**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Vertex | Location | | Battery demand | Unloading time (min) | Time  window |
| X (km) | Y (km) |
| 1 | 3 | 5 | 8 | 6.4 | [6:00, 7:30] |
| 2 | 4 | 16 | 9 | 7.2 | [5:30, 6:30] |
| 3 | 9 | 4 | 12 | 9.6 | [6:00, 7:30] |
| 4 | 13 | 14 | 10 | 8.0 | [5:30, 6:30] |
| 5 | 10 | 17 | 12 | 9.6 | [5:30, 6:30] |
| 6 | 14 | 9 | 12 | 9.6 | [5:30, 6:30] |
| 7 | 17 | 3 | 10 | 8.0 | [6:30, 7:30] |
| 8 | 19 | 16 | 11 | 8.8 | [5:30, 6:30] |
| 9 | 24 | 3 | 8 | 6.4 | [6:00, 7:30] |
| 10 | 24 | 14 | 10 | 8.0 | [5:30, 6:30] |
| 11 | 20 | 7 | 12 | 9.6 | [6:30, 7:30] |
| 12 | 7 | 11 | / | / | / |
| 13 | 27 | 8 | / | / | / |