**7.23**

A)

|  |  |  |  |
| --- | --- | --- | --- |
| **Process** | **Allocated (Release)** | **Max** | **Need** |
| P0 | 2 0 0 1 | 4 2 1 2 | 2 2 1 1 |
| P1 | 3 1 2 1 | 5 2 5 2 | 2 1 3 1 |
| P2 | 2 1 0 3 | 2 3 1 6 | 0 2 1 3 |
| P3 | 1 3 1 2 | 1 4 2 4 | 0 1 1 2 |
| P4 | 1 4 3 2 | 3 6 6 5 | 2 2 3 3 |

**Available:** (3 3 2 1)

3 3 2 1 + 2 0 0 1 (P0) = 5 3 2 2

5 3 2 2 + 3 1 2 1 (P1) = 8 4 4 3

8 4 4 3 + 2 1 0 3 (P2) = 10 5 4 6

10 5 4 6 + 1 3 1 2 (P4) = 11 8 5 8

11 8 5 8 + 1 4 3 2 (P5) = 12 12 8 10

B) YES

C) YES