## 5.modul számonlérő teszt

**Feladat**

Tervezzen 3 bites szinkron sorrendi hálózatot szinkron kezdőérték beállítással, amely a következő jellemzőkkel rendelkezik:

* Bejárandó állapotok: RES→5,6,7,0,1,3,4,5, és újra 6-tól
* Felhasználandó flip-flop-ok: T, JK, D
* Az engedélyező jel magas szinten aktív

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | n. állapot | | | n+1. állapot | | | Flip-flop-ok  bemenetei | | | |
| **S.** | **R** | **E** | **QC** | **QB** | **QA** | **QC** | **QB** | **QA** | **TC** | **JB** | **KB** | **DA** |
| 0. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | X | 0 |
| 1. | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | X | 1 |
| 2. | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | X | 0 | 0 |
| 3. | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | X | 0 | 1 |
| 4. | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | d | 0 |
| 5. | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | d | 1 |
| 6. | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | X | 0 | 0 |
| 7. | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | X | 0 | 1 |
| 8. | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | X | 1 |
| 9. | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | X | 1 |
| 10. | 0 | 1 | 0 | 1 | 0 | X | X | X | X | X | X | X |
| 11. | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | X | 1 | 0 |
| 12. | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | X | 1 |
| 13. | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | X | 0 |
| 14. | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | X | 0 | 1 |
| 15. | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | X | 1 | 0 |
| 16. | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | X | 1 |
| 17. | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | X | 1 |
| 18. | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | X | 1 | 1 |
| 19. | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | X | 1 | 1 |
| 20. | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | X | 1 |
| 21. | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | X | 1 |
| 22. | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | X | 1 | 1 |
| 23. | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | X | 1 | 1 |
| 24. | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | X | 1 |
| 25. | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | X | 1 |
| 26. | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | X | 1 | 1 |
| 27. | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | X | 1 | 1 |
| 28. | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | X | 1 |
| 29. | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | X | 1 |
| 30. | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | X | 1 | 1 |
| 31. | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | X | 1 | 1 |

**Működési tábla felírása (szinkron kezdőérték beállítással):**

|  |  |  |
| --- | --- | --- |
| **Qn** | **Qn+1** | **T** |
| 0 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 0 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Qn** | **Qn+1** | **J** | **K** |
| 0 | 0 | 0 | d |
| 0 | 1 | 1 | d |
| 1 | 0 | d | 1 |
| 1 | 1 | d | 0 |

|  |  |  |
| --- | --- | --- |
| **Qn** | **Qn+1** | **D** |
| 0 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 0 |
| 1 | 1 | 1 |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **TC** |  | **QB** | | | |  |  |  |  |  |
|  | **QA** | |  |  | **QA** | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
| **0** | **1** | **3** | **2** | **6** | **7** | 5 | **4** |  |  |  |
| **8** | **9** | **11**  **1** | **10**  **X** | **14** | **15**  **1** | **13** | **12** |  | **E** |  |
| **24**  **1** | **25**  **1** | **27**  **1** | **26**  **1** | **30** | **31** | **29** | **28** |  | **R** |
| **16**  **1** | **17**  **1** | **19**  **1** | **18**  **1** | **22** | **23** | **21** | **20** |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  | **QC** | | | |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **JB** |  | **QB** | | | |  |  |  |  |  |
|  | **QA** | |  |  | **QA** | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
| **0** | **1** | **3**  **X** | **2**  **X** | **6**  **X** | **7**  **X** | 5 | **4** |  |  |  |
| **8** | **9**  **1** | **11**  **X** | **10**  **X** | **14**  **X** | **15**  **X** | **13**  **1** | **12** |  | **E** |  |
| **24** | **25** | **27**  **X** | **26**  **X** | **30**  **X** | **31**  **X** | **29** | **28** |  | **R** |
| **16** | **17** | **19**  **X** | **18**  **X** | **22**  **X** | **23**  **X** | **21** | **20** |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  | **QC** | | | |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **KB** |  | **QB** | | | |  |  |  |  |  |
|  | **QA** | |  |  | **QA** | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
| **0**  **X** | **1**  **X** | **3** | **2** | **6** | **7** | 5  **X** | **4**  **X** |  |  |  |
| **8**  **X** | **9**  **X** | **11**  **1** | **10**  **X** | **14** | **15**  **1** | **13**  **X** | **12**  **X** |  | **E** |  |
| **24**  **X** | **25**  **X** | **27**  **1** | **26**  **1** | **30**  **1** | **31**  **1** | **29**  **X** | **28**  **X** |  | **R** |
| **16**  **X** | **17**  **X** | **19**  **1** | **18**  **1** | **22**  **1** | **23**  **1** | **21**  **X** | **20**  **X** |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  | **QC** | | | |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DA** |  | **QB** | | | |  |  |  |  |  |
|  | **QA** | |  |  | **QA** | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
| **0** | **1**  **1** | **3**  **1** | **2** | **6** | **7**  **1** | 5  **1** | **4** |  |  |  |
| **8**  **1** | **9**  **1** | **11** | **10**  **X** | **14**  **1** | **15** | **13** | **12**  **1** |  | **E** |  |
| **24**  **1** | **25**  **1** | **27**  **1** | **26**  **1** | **30**  **1** | **31**  **1** | **29**  **1** | **28**  **1** |  | **R** |
| **16**  **1** | **17**  **1** | **19**  **1** | **18**  **1** | **22**  **1** | **23**  **1** | **21**  **1** | **20**  **1** |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  | **QC** | | | |  |  |  |

**Kapcsolási rajz**

A képen diagram, sematikus rajz látható

Automatikusan generált leírás