実技課題解答

実技課題

「カウンタ回路製作」解答

（１）ＪＫ－ＦＦ真理値表

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 入力 | | | | | 出力 | |
| SET | CLR | CLK | J | K | Q |  |
| 0 | 1 | d | d | d | 1 | 0 |
| 1 | 0 | d | d | d | 0 | 1 |
| 1 | 1 |  | 0 | 0 | Q |  |
| 1 | 1 |  | 0 | 1 | 0 | 1 |
| 1 | 1 |  | 1 | 0 | 1 | 0 |
| 1 | 1 |  | 1 | 1 |  | Q |



（２）同期式１０進カウンタ状態遷移表



（３）カルノー図

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | Q1Q0 | | | |
|  |  | 00 | 01 | 11 | 10 |
| Q3Q2 | 00 | 0 | 1 | d | d |
| 01 | 0 | 1 | d | d |
| 11 | d | d | d | d |
| 10 | 0 | 0 | d | d |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | Q1Q0 | | | |
|  |  | 00 | 01 | 11 | 10 |
| Q3Q2 | 00 | 0 | 0 | 1 | 0 |
| 01 | d | d | d | d |
| 11 | d | d | d | d |
| 10 | 0 | 0 | d | d |

表　J2　のカルノー図

表　　J1のカルノー図

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | Q1Q0 | | | |
|  |  | 00 | 01 | 11 | 10 |
| Q3Q2 | 00 | 0 | 0 | 0 | 0 |
| 01 | 0 | 0 | 1 | 0 |
| 11 | d | d | d | d |
| 10 | d | d | d | d |

表　J3　のカルノー図

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | Q1Q0 | | | |
|  |  | 00 | 01 | 11 | 10 |
| Q3Q2 | 00 | d | d | d | d |
| 01 | 0 | 0 | 1 | 0 |
| 11 | d | d | d | d |
| 10 | d | d | d | d |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | Q1Q0 | | | |
|  |  | 00 | 01 | 11 | 10 |
| Q3Q2 | 00 | d | d | 1 | 0 |
| 01 | d | d | 1 | 0 |
| 11 | d | d | d | d |
| 10 | 0 | 1 | d | d |

表　　K1のカルノー図

表　K2　のカルノー図

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | Q1Q0 | | | |
|  |  | 00 | 01 | 11 | 10 |
| Q3Q2 | 00 | d | d | d | d |
| 01 | d | d | d | d |
| 11 | d | d | d | d |
| 10 | 0 | 1 | d | d |

表　K3　のカルノー図

（４）論理式





（５）回路図

