**Design a counter that counts 2, 7, 4, 3, 5, 1 using D Flip-flops. *(5 Points)***

**Requirement(s):**

Answer the following:

**Question 1: Fill the below table (0.25 Point for each)**

|  |  |
| --- | --- |
| **# External Inputs** |  |
| **# External Outputs** |  |
| **# Flip-flops** |  |
| **# Total inputs of this circuit** |  |
| **# Outputs** |  |

**Question 2: Analysis/State Diagram (0.75 Point) [***paste your solution as a screenshot in the below textbox***]**

**Question 3: Fill the below table (0.25 Point for each)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **An** | **Cn** | **DA** | **DB** | **An+1** | **Bn+1** | **Cn+1** |
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**Question 4: True/False [***with justification***] (0.25 Point for each)**

|  |  |
| --- | --- |
| 1. **DB = An`•Bn` + Cn`** | **Answer:**  **Why:** |
| 1. **DC = An^Bn** | **Answer:**  **Why:** |
| 1. **DA = Bn** | **Answer:**  **Why:** |

**Question 5: Design of this circuit (0.25 Point) [***paste your solution as a screenshot in the below textbox***]**

**Rules**:

1. Any submissions after the deadline are not acceptable.
2. Important Plagiarism Notice:
   1. Deliverables based on other students’ solutions lead to rejection of BOTH deliverables.
   2. Examples of plagiarism (but not limited to) copying (partial) code from other students, open-source software (or Internet in general), tutors, etc.

**Verilog + ZYBO Z7 board Help:**

* Check this link for Verilog syntax: <https://www.nandland.com/verilog/tutorials/index.html>
* Check this link for ZYBO Z7 board info.: <https://digilent.com/reference/programmable-logic/zybo/start>

**If you need any help regarding anything about the course, ask:**

* Engr. Ahmad M. Abdel-Hafeez: [akassem@nu.edu.eg](mailto:akassem@nu.edu.eg)
* Engr. Mohammad Rady: [mrady@nu.edu.eg](mailto:mrady@nu.edu.eg)