* **Team no 16**

**INVX1 characterstics**

1. **Input pin capacitances:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Input Pins** | **Rise Cap (pF)** | **Fall Cap (pF)** | **Average Cap (pF)** |
| A | 1.95e-3 | 8.83e-3 | 5.39e-3 |

1. **Transition Time Table:** (please strictly consider 20% and 80% of VDD for transition time)

**(i) Output Rise Transitions** **(in ns)** [Input slew vs output capacitance].

**Related pin A**: (i.e., other input pins are held constant)

|  |  |  |  |
| --- | --- | --- | --- |
|  | **10 ps** | **100 ps** | **1000 ps** |
| **0.5 fF** | 0.0112 | 0.0215 | 0.0882 |
| **10 fF** | 0.0671 | 0.0675 | 0.1824 |
| **100 fF** | 0.5974 | 0.5974 | 0.6096 |

**(ii) Output Fall Transitions** **(in ns)** [Input slew vs output capacitance].

**Related pin A**: (i.e., other input pins are held constant)

|  |  |  |  |
| --- | --- | --- | --- |
|  | **10 ps** | **100 ps** | **1000 ps** |
| **0.5 fF** | 0.0115 | 0.0192 | 0.0788 |
| **10 fF** | 0.0716 | 0.0716 | 0.1736 |
| **100 fF** | 0.6405 | 0.6405 | 0.6472 |

1. **Propagation delay time tables**: (unlike textbook definitions that we used for our assignments, here we will use 50% of input to 50% of output to simulate propagation delay – by keeping other inputs fixed).

**(i) Cell Rise Delay (in ns)** [Input slew vs output capacitance].

**Related pin A**: (i.e., other input pins are held constant)

|  |  |  |  |
| --- | --- | --- | --- |
|  | **10 ps** | **100 ps** | **1000 ps** |
| **0.5 fF** | 0.0133 | 0.0309 | 0.0746 |
| **10 fF** | 0.0522 | 0.0746 | 0.2168 |
| **100 fF** | 0.4140 | 0.4368 | 0.6667 |

**(ii) Cell Fall Delay (in ns)** [Input slew vs output capacitance].

**Related pin A**: (i.e., other input pins are held constant)

|  |  |  |  |
| --- | --- | --- | --- |
|  | **10 ps** | **100 ps** | **1000 ps** |
| **0.5 fF** | 0.0171 | 0.0325 | 0.0702 |
| **10 fF** | 0.0641 | 0.0835 | 0.2126 |
| **100 fF** | 0.4999 | 0.5202 | 0.7259 |

1. **Static Power (cover all possible input combinations based on number of inputs).**

|  |  |
| --- | --- |
| **Condition (ABC)** | **Power (nW)** |
| 0 | 3.294e-3 |
| 1 | 108.6e-3 |

1. **Dynamic Power Table:**

**(i) Rise Power (in nW)** [Input slew vs output capacitance].

**Related pin A**: (i.e., other input pins are held constant)

|  |  |  |  |
| --- | --- | --- | --- |
|  | **10 ps** | **100 ps** | **1000 ps** |
| **0.5 fF** | 359224 | 83467 | 17838 |
| **10 fF** | 390483 | 209612 | 68202 |
| **100 fF** | 396940 | 236172 | 197730 |

**(ii) Fall Power (in nW)** [Input slew vs output capacitance].

**Related pin A**: (i.e., other input pins are held constant)

|  |  |  |  |
| --- | --- | --- | --- |
|  | **10 ps** | **100 ps** | **1000 ps** |
| **0.5 fF** | 235086 | 30042 | 3060 |
| **10 fF** | 177093 | 21771 | 2646 |
| **100 fF** | 163881 | 16137 | 2142 |