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CMPEN 271

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HW #2

# Nuclear Power Plant Alarm

Design a circuit for nuclear power plant alarm. Construct a) truth table, b) Boolean expression, c) draw logic circuit, and d) simulate with Multisim (or equivalent) circuit simulation software. Clearly label all inputs and outputs.

Truth Table

INPUTS: 1 = True / 0 = False OUTPUT:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| CORE TEMP (HIGH) | FUEL RODS (DOWN) | CONTROL RODS (UP) | SYSTEM STATUS (FAILED) | ACTIVATE |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 1 | 1 |
| 0 | 0 | 1 | 0 | 0 |
| 0 | 0 | 1 | 1 | 1 |
| 0 | 1 | 0 | 0 | 0 |
| 0 | 1 | 0 | 1 | 1 |
| 0 | 1 | 1 | 0 | 0 |
| 0 | 1 | 1 | 1 | 1 |
| 1 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 1 | 1 |
| 1 | 0 | 1 | 0 | 0 |
| 1 | 0 | 1 | 1 | 1 |
| 1 | 1 | 0 | 0 | 0 |
| 1 | 1 | 0 | 1 | 1 |
| 1 | 1 | 1 | 0 | 1 |
| 1 | 1 | 1 | 1 | 1 |

Boolean expression:

ACTIVATE = (coreTempHigh)•(fealrodsDown)•(controlrodsUp) + (coolsysstatFail)

Circuit:

