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NPTEL (https://swayam.gov.in/explorer?ncCode=NPTEL) » Information Security - 5 - Secure Systems Engineering (course)

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Course outline

About NPTEL ()

How does an NPTEL online course work? ()

Week 1 ()

Week 2 ()

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Week 8 : Assignment 8

The due date for submitting this assignment has passed.

Due on 2025-03-19, 23:59 IST.

Assignment submitted on 2025-03-16, 11:38 IST

1) Which of the following best describes the main purpose of FANCI? ***1 point***

- To detect software vulnerabilities
- To identify stealthy malicious logic in hardware designs
- To optimize power consumption in ICs
- To improve circuit performance

Yes, the answer is correct.
Score: 1

Accepted Answers:
To identify stealthy malicious logic in hardware designs

2) What is a key characteristic of Hardware Trojans that FANCI exploits for detection? ***1 point***

- High power consumption
- Complex logic gates
- Nearly-unused circuit elements
- Frequent state transitions

Yes, the answer is correct.
Score: 1

Accepted Answers:
Nearly-unused circuit elements

3) In the context of Hardware Trojan prevention, what does "Split Manufacturing for Trust" primarily aim to achieve? ***1 point***

- (●) Divide the manufacturing process among multiple vendors
- ( ) Separate the design and fabrication processes
- ( ) Split the IC into multiple smaller chips
- ( ) Distribute the testing phase across different facilities

No, the answer is incorrect.
Score: 0
Accepted Answers:
Separate the design and fabrication processes

4) Which of the following is NOT a common method for Hardware Trojan detection in post-silicon stages? ***1 point***

- ( ) Optical detection
- ( ) Logic testing
- ( ) Side-channel signal analysis
- (●) Code review

Yes, the answer is correct.
Score: 1
Accepted Answers:
Code review

5) What is a primary challenge in using power analysis attacks to detect Hardware Trojans? ***1 point***

- ( ) Power consumption is too low to measure accurately
- (●) Trojans may consume very little additional power
- ( ) Power analysis requires expensive equipment
- ( ) Power consumption is not related to circuit behavior

Yes, the answer is correct.
Score: 1
Accepted Answers:
Trojans may consume very little additional power

6) Which of the following best describes a "trigger" in the context of Hardware Trojans? ***1 point***

- (●) A mechanism to activate the Trojan's payload
- ( ) A tool used to detect Trojans
- ( ) A type of logic gate used in Trojan circuits
- ( ) A method to prevent Trojan insertion

Yes, the answer is correct.
Score: 1
Accepted Answers:
A mechanism to activate the Trojan's payload

7) In the AES algorithm, which type of fault attack aims to reduce the number of rounds to weaken the encryption? ***1 point***

- Bit flip attack
- Clock glitch attack
- Voltage spike attack
- Electromagnetic pulse attack

Yes, the answer is correct.
Score: 1
Accepted Answers:
Clock glitch attack

8) [True/False] Side-channel analysis methods can detect Hardware Trojans by analyzing physical parameters such as delay, energy consumption, and electromagnetic emanations. ***1 point***

- True
- False

Yes, the answer is correct.
Score: 1
Accepted Answers:
True

9) FANCI requires complete test suite coverage to operate without false negatives. ***1 point***

- True
- False

Yes, the answer is correct.
Score: 1
Accepted Answers:
False

10) Match the protection/detection techniques with their corresponding descriptions: ***1 point***

1. Locking mechanism	A. Analyzing electromagnetic activity to detect anomalies
2. Obfuscation	B. Adding redundant circuits to mask the original design
3. Reverse engineering	C. Implementing a key-based activation system for the IC
4. EM side-channel	D. Extracting the circuit design from the physical chip

- 1:C 2:B 3:D 4:A
- 1:B 2:C 3:D 4:A
- 1:C 2:A 3:B 4:D
- 1:B 2:C 3:A 4:D

Yes, the answer is correct.
Score: 1

Accepted Answers:
1:C 2:B 3:D 4:A