Quiz on Computational Theory

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1. Q: What is a Turing Machine capable of emulating?

Options:

a) Only finite state automata

b) Only context-free grammars

c) Both deterministic and non-deterministic finite automata

d) Only deterministic finite automata and context-free grammars

Correct Answer: d

2. Q: What is the Church-Turing thesis about?

Options:

a) A mathematical proof that Turing Machines can solve any computational problem

b) A philosophical hypothesis stating that any effectively calculable function c

c) A theory that all algorithms are equivalent to each other

d) A model for artificial intelligence

Correct Answer: b

3. Q: What is the time complexity of an algorithm with Big O notation equal to O

Options:

a) Linear in n, where n represents the size of input data

b) Quadratic in n, where n represents the size of input data

c) Logarithmic in n, where n represents the size of input data

d) Exponential in n, where n represents the size of input data

Correct Answer: b

4. Q: Which of the following is not a fundamental property of computation accord

Options:

a) Effectivity

b) Normal form theorem

c) Church-Turing thesis

d) Recursive function theorem

Correct Answer: a

5. Q: Which of the following languages cannot be decided by a Turing Machine?

Options:

a) The set of all palindromes (strings that read the same forward and backward)

b) The set of all prime numbers

c) The set of all strings containing only the letter 'a'

d) The set of all strings with an even number of 'a's

Correct Answer: b