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| MT-521 | Computational Complexity and Applications |
| | <p><u>Computational Tasks and Models:</u> Representation, Computational tasks, Computational model, Uniform models (algorithms), Universal algorithms, Time and space complexity, Boolean circuits, Complexity classes, Complexity hierarchies.</p> <p><u>Algorithms and Decision Trees:</u> Problems and algorithms, Turing machines, Computability decision trees and complexity, Certificate complexity, Randomized decision tree, Techniques for proving decision tree lower bound.</p> <p><u>Cryptography:</u> Perfect secrecy and its limitation, Computational security, Zero knowledge, Applications.</p> <p><u>Proof Complexity:</u> Proof systems, Propositional calculus and resolution (PCR), lower bounds in proof complexity.</p> <p><u>Reference Books:</u></p> <ol style="list-style-type: none">1. Hemaspaandra L.A and Ogihara M, <i>The Complexity Theory Companion</i>, Springer, 2002.2. Goldreich O, <i>Computational Complexity: A Conceptual Perspective</i>, Cambridge University Press, 2008.3. Arora S and Barak B, <i>Computational Complexity: A Modern Approach</i>, Cambridge University Press, 2009. |