Quiz on Intractability

1.The worst-case efficiency of solving a problem in polynomial time is?
a) O(p(n))
b) O(p(n log n))
c) O(p(n2))
d) O(p(m log n))

Answer:

A)The worst-case efficiency of solving an problem in polynomial time is O(p(n)) where p(n) is the polynomial time of input size.

2. Which of the following statements best describes intractable problems in computational theory?
A) Intractable problems are those that can be solved quickly using efficient algorithms.
B) Intractable problems are those for which an optimal solution can be found in polynomial time.
C) Intractable problems are those that become increasingly difficult to solve as the input size grows.
D) Intractable problems are those that have a simple and straightforward algorithmic solution.
E) Intractable problems are those that only occur in theoretical discussions and have no practical applications.

Answer:

C) Intractable problems are those that become increasingly difficult to solve as the input size grows.

3.Consider a decision problem X that is known to be NP-complete. Which of the following statements is true regarding problem X?
A) Problem X can be solved in polynomial time using efficient algorithms.
B) Problem X can be solved using divide and conquer techniques.
C) Problem X can be solved using a greedy algorithm.
D) Problem X is at least as hard as the hardest problems in the NP class.
E) Problem X is only difficult to verify but can be solved efficiently for small inputs.

Answer:

D) Problem X is at least as hard as the hardest problems in the NP class.
These solutions aim to test your understanding of the concepts related to intractability and computational complexity. Intractable problems are characterized by their increasing difficulty with larger inputs, and NP-completeness signifies that a problem is at least as hard as the hardest problems in the NP class.