Check Understanding – Multiple Choice Questions

Topic: Trade-offs (Computer Science & Systems)

1. What is meant by a trade-off in computer science?

   A. Choosing one option without any disadvantages
   B. Balancing between two or more competing factors
   C. Always selecting the fastest solution
   D. Avoiding complexity at all costs

2. Which trade-off is most common when choosing a data structure?

   A. Speed vs. memory usage
   B. Syntax vs. semantics
   C. Hardware vs. software
   D. Input vs. output

3. Using an array instead of a linked list mainly improves:

   A. Insertion speed
   B. Deletion speed
   C. Cache locality and random access time
   D. Dynamic memory allocation

4. Which trade-off is involved when increasing system security?

   A. Security vs. usability
   B. Speed vs. correctness
   C. Cost vs. storage
   D. Memory vs. power

5. In algorithm design, what is the typical trade-off when reducing time complexity?

   A. Lower accuracy
   B. Higher space complexity
   C. Lower readability
   D. More user interaction

6. Why might a developer choose a simpler algorithm over an optimal one?

   A. To reduce compilation time
   B. To improve maintainability and readability
   C. To increase hardware usage
   D. To eliminate all bugs

7. What trade-off is involved when using caching?

   A. Memory usage vs. performance
   B. Security vs. reliability
   C. Portability vs. speed
   D. Accuracy vs. precision

8. Choosing a distributed system over a centralized one mainly introduces which trade-off?

   A. Speed vs. memory
   B. Scalability vs. complexity
   C. Cost vs. power
   D. Latency vs. bandwidth

9. In embedded systems, which trade-off is most critical?

    A. User experience vs. design
    B. Power consumption vs. performance
    C. Network vs. storage
    D. Readability vs. abstraction

10. Why are trade-offs unavoidable in system design?

    A. Because technology is outdated
    B. Because resources are unlimited
    C. Because improving one aspect often worsens another
    D. Because documentation is incomplete

Answer Key

1. B
2. A
3. C
4. A
5. B
6. B
7. A
8. B
9. B
10. C