

AP Computer Science Principles

Name: _____ Score: _____

1. The Internet is:

- ☐ one website
- ☐ a programming language
- ☐ a single computer
- ☐ a network of interconnected networks

2. A fault-tolerant system:

- ☐ runs only once
- ☐ never has any parts
- ☐ keeps working even if part of it fails
- ☐ stops at the first error

3. In sequential computing:

- ☐ steps run on many computers
- ☐ all steps happen at once
- ☐ there are no steps
- ☐ each step must finish before the next begins

4. An agreed set of rules for how systems exchange data is a _____.

5. Having more than one path or copy so a backup takes over is called _____.

6. A task takes 100 s on one processor and 40 s on several. What is the speedup?

_____ times

7. Data is sent across the Internet as:

- ☐ one large block on one cable
- ☐ a single letter at a time
- ☐ nothing
- ☐ small packets that travel independently

8. A single point of failure is:

- ☐ a backup server
- ☐ an extra network route
- ☐ a fast connection
- ☐ one part whose failure stops the entire system

9. If 20 s of a 100 s task must run sequentially, what is the maximum possible speedup?

_____ times

10. Redundancy means there is usually more than one path between two points, so a failed link can be bypassed.

- ☐ True ☐ False

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1. **a network of interconnected networks**

Millions of smaller networks joined into one global system.

2. **keeps working even if part of it fails**

No single failure brings the whole system down.

3. **each step must finish before the next begins**

One step at a time, in order.

4. **protocol**

Protocols let different machines cooperate.

5. **redundancy**

Redundancy is the main way to achieve fault tolerance.

6. **2.5 times**

$\text{speedup} = 100 / 40 = 2.5\times$.

7. **small packets that travel independently**

Packets take possibly different routes and are reassembled in order.

8. **one part whose failure stops the entire system**

A network with one central router has a single point of failure.

9. **5 times**

Even with infinite processors, 20 s remains: $100 / 20 = 5\times$.

10. **True**

Multiple paths are why the Internet keeps working when parts fail.