Continuing Education Course #196
Structural Concepts
for Non-Structural Engineers

1. What is a structure?
- a. An engine
- b. A framework
- c. A specified shape

2. "Moment" means:
- a. A force being applied at a distance from the point being investigated.
- b. A short period of time
- c. An important event

3. How can you find out what is the maximum stress that a material is capable of withstanding?
- a. Calculate it
- b. Look it up
- c. Break a sample of the material

4. Strength is a function of what property?
- a. Material (aluminum, steel, etc.)
- b. Shape
- c. Size
- d. All of the above.

5. In general, the design of a structure is driven either by the requirement that it be stiff or the requirement that it be strong.
- a. T
- b. F

6. For a given load, a beam that is twice as long will stretch _____ as much under an axial load.
- a. Four times
- b. A little bit more
- c. Twice as much

7. For a given load, a beam that is twice as long will deflect sideways _____ as much under a side load.
- a. Eight times
- b. Four times
- c. Two times

8. When the original one-inch-square beam was cut apart and reassembled into an I-beam, why did the moment of inertia increase?

- ○ a. The beam got lighter
- ○ b. The beam was shaped like an I-beam
- ○ c. More area was placed farther from the center.

9. A bar that is square in cross-section cannot withstand a torsional load.
- ○ a. T
- ○ b. F

10. A beam that has buckled is always permanently deformed.
- ○ a. T
- ○ b. F

11. More accuracy is always better.
- ○ a. Yes
- ○ b. No

12. Vectors can be added by drawing them to scale and placing them _____.
- ○ a. tail to tail
- ○ b. head to tail

13. The bolts that join a triangle of structural members _____ to make the structure rigid.
- ○ a. Must be tight
- ○ b. Must be loose
- ○ c. Can be either tight or loose.

14. If a complex structure made up of an array of triangles, like a bridge, has known loads applied to it, the loads in the individual members may be found by:
- ○ a. Vectors
- ○ b. Trigonometry
- ○ c. Computers
- ○ d. Any of the above

15. The use of carbon fiber will probably remain limited to "high tech" products like satellites and racecars, because of its high cost.
- ○ a. T
- ○ b. F