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Continuing Education Course #631

1. Which of the following is not a fact about the World Trade Center?
 - a. It was a symbol of globalization and highlighted the US economy
 - b. It comprised of seven buildings in all
 - c. The Twin Towers alone had 10 million square feet of office space
 - d. WTC building designs had to be approved by United Nations
 - e. The cost to build was \$900 million
2. The structural system of WTC 1 & 2 was...
 - a. Core and outrigger
 - b. Infilled frame wall
 - c. Coupled wall
 - d. Braced frames
 - e. Framed-tube
3. The gravity loads on the WTC towers were resisted in part by all of these components except:
 - a. Exterior columns
 - b. Core columns
 - c. Elevator shafts
 - d. Hat truss
 - e. Floor trusses
4. True or false: The excavated soil and rock from the WTC site was reclaimed to create new real estate on Manhattan Island.
 - a. True
 - b. False
5. Which of the following reinforcements supported the foundation slurry wall during construction?
 - a. Geogrids
 - b. Tie-back anchors
 - c. Cement amending soil
 - d. Soldier piles
 - e. MSE wall
6. What was the scenario which foresighted designers considered during design that affected the results of 9/11?
 - a. Acts of war
 - b. Terrorism
 - c. Stock market crash
 - d. Corrosion due to flooding
 - e. Accidental airplane crash

7. What event prompted increased security and defense measures to be implemented into the WTC?
- a. The fall of the Berlin Wall
 - b. The Gulf War
 - c. Clinton impeachment trials
 - d. Oklahoma City bombing
 - e. 1993 parking garage bomb
8. Common fire protection measures in high-rise buildings include all except...
- a. Anti-ram barriers
 - b. Fireproofing steel framing
 - c. Sprinkler systems
 - d. Fire alarm systems
 - e. Communication systems
9. The impact energy from the hijacked aircraft compared with the chemical energy of the jet fuel on board the airplane is...
- a. Significantly lower
 - b. Significantly higher
 - c. About equivalent
 - d. Half as much
 - e. None of the above
10. Most of the jet fuel on board the hijacked airplanes burned...
- a. Outside the towers
 - b. Inside the towers
 - c. Before impact
 - d. After the towers collapsed
 - e. The day after 9/11
11. Which phenomena did not occur in WTC 1 & 2 structures during 9/11?
- a. Fatigue
 - b. Sway and damping
 - c. Local buckling
 - d. Thermally-induced strain
 - e. Temperature induced strength loss
12. True or False: Progressive collapse begins when a critical load-bearing element fails and causes adjacent failure.
- a. True
 - b. False
13. The underlying reason for total collapse of WTC 1 & 2 is...
- a. Fire induced heat damage
 - b. Damage caused by impact
 - c. Initial jet fuel fire
 - d. Loss of fireproofing material
 - e. All of the above
14. Which of the following did not contribute to preventing a higher loss of life on 9/11?
- a. The slurry wall foundation system remaining intact
 - b. Evacuation efforts occurring between impact and collapse
 - c. Blocked stairways and exit routes

- d. Robustness of the building structures
- e. Hat truss integrity

15. Which structural factor did not enhance the buildings' performance during 9/11?

- a. Dense spacing of perimeter columns
- b. Seismic retrofits
- c. Wind loads that exceeded NYC building codes
- d. Composite floor system with open-web joists
- e. Hat truss load redistribution