

BUILDING FOR THE EARTHQUAKES OF TOMORROW:

Complying with Executive Order 12699

FINAL EXAMINATION

This exam is intended to test your mastery of the course objectives. There is only one correct answer for each question. When you have finished taking this test, please return to our website at <http://www.training.fema.gov/EMIWeb/IS/IS8A.asp> and click on "Take Final Exam".

Your examination will be evaluated and the results returned to you as quickly as possible.

Multiple Choice

1. Which of the following activities may be considered mitigation?
 - a. Emergency medical services to individuals following an earthquake.
 - b. Post earthquake reconstruction.
 - c. Adoption of zoning.
 - d. Establishment of temporary housing.

2. A community that is likely to incur a great deal of damage during an earthquake is referred to as having a high seismic _____.
 - a. impact
 - b. hazard
 - c. cost
 - d. risk

3. NEHRP was created as a result of:
 - a. Executive Order 12699.
 - b. Earthquake Hazards Reduction Act.
 - c. ICSSC recommendations.
 - d. Nuclear Regulatory Commission mandate.

4. In order to make the construction of seismically safe buildings economically possible, the ICSSC drafted Executive Order 12699 to mandate that a building should be designed to prevent:
 - a. damage.
 - b. collapse.
 - c. defacement.
 - d. All of the above.

5. The NEHRP *Provisions* addressed effective methods of seismic design and construction of:
 - a. buildings in high risk areas.
 - b. buildings in moderate risk areas.
 - c. buildings in low risk areas.
 - d. All of the above.

6. Scientists use _____ waves to find an earthquake's epicenter.
 - a. body
 - b. core
 - c. Love
 - d. surface

7. _____ waves cause most of the damage to the built environment during an earthquake.
 - a. body
 - b. primary
 - c. secondary
 - d. surface

8. Earthquake activity can be caused by _____ movement of plates.
 - a. convergent
 - b. divergent
 - c. lateral
 - d. All of the above.

9. A fault is a fracture in the earth's outer shell, on either side of which rock mass moves _____.
- horizontally
 - vertically
 - both horizontally and vertically
 - Any of the above.
10. Seismic waves generally travel much shorter distances on the West Coast than on the East Coast because:
- the soil composition is different in the two regions.
 - the earthquakes are of a greater intensity on the East Coast.
 - earthquakes are more frequent on the West Coast.
 - communities are better prepared for earthquakes on the West Coast.
11. The Modified Mercalli Intensity Scale measures the _____ of an earthquake.
- magnitude
 - speed
 - frequency
 - impact
12. The Richter Scale measures the _____ of an earthquake.
- magnitude
 - speed
 - frequency
 - impact
13. Liquefaction occurs when:
- water from a seiche washes away soil.
 - flooding occurs as a secondary effect of an earthquake.
 - ground motion causes loose, sandy soil to act like a fluid.
 - rivers are created at fault lines.
14. Which term refers to powerful ocean waves caused by an earthquake, landslide, or volcanic eruption on the sea floor?
- Tsunami
 - Seiche
 - Ductile
 - Drift

15. When a building and the ground vibrate at the same rate, they resonate and the vibrations _____ .
- increase, putting less stress on the building
 - increase, putting more stress on the building
 - decrease, putting less stress on the building
 - decrease, putting more stress on the building
16. Partitions, ceilings, and exterior walls can _____ a building's vibration.
- increase
 - transfer
 - dampen
 - eliminate
17. Which of the following is not a horizontal bracing system?
- Diaphragm
 - Shear wall
 - Braced frame
 - Moment-resistant
18. The NEHRP *Provisions* provide two seismic hazard maps that contain quantitative measures from which seismic forces on buildings may be determined. Which of the following variables were not considered in developing these maps?
- Historical seismicity of an area
 - Area's proximity to known faults
 - Geological investigations
 - Types of structures built in an area
19. Buildings are assigned to Seismic Use Groups on the basis of _____ .
- community's need
 - age
 - quality of construction
 - All of the above.
20. The *Provisions* consider a building's seismicity and its Seismic Use Group and assign it to a _____ in order to define its seismic safety requirements.
- Provisions Category
 - Requirements Category
 - Seismic Risk Category
 - Seismic Design Category

21. What is the clearest indication that your community is seismically safe?
- a. A recent earthquake occurred and caused no injuries or damage.
 - b. Earthquake hazard maps say the seismicity of your State is low.
 - c. Your community adopted a recent version of a model building code, including its seismic provisions.
 - d. Building codes have been in use for years.

True or False

22. If the region in which you live has not experienced an earthquake in 200 years, your earthquake hazard is low.
- a. True
 - b. False
23. Two of the objectives of NEHRP were to educate the public about earthquake risk reduction and increase the use of existing scientific and engineering knowledge to mitigate earthquake hazards.
- a. True
 - b. False
24. The owner of a new office building, currently under construction, is going to lease 20 percent of the building's space to the Federal Government and is therefore subject to the requirements of Executive Order 12699.
- a. True
 - b. False
25. All Federal agencies have the same seismic safety standards.
- a. True
 - b. False
26. Temporary as well as permanent structures built following a disaster using Federal funds through the Stafford Act must meet the requirements of Executive Order 12699.
- a. True
 - b. False

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27. A building constructed according to the NEHRP *Provisions* may sustain enough damage during an earthquake that it must be demolished.
- a. True
 - b. False
28. All faults will cause earthquakes.
- a. True
 - b. False
29. A tall building has a longer natural period than a short one.
- a. True
 - b. False
30. The ideal characteristics for building materials in seismically active areas are ductility and stiffness.
- a. True
 - b. False