

## E/L 0276 Intro to BCA: Pre-Course Assessment

ANSWER KEY: Correct answers are marked in bold with \*\*\*

1. What is Benefit-Cost Analysis (BCA)?
  - a. **The process of quantifying the benefits of an action and comparing it to its costs\*\*\***
  - b. The process of adding the benefits and costs of an action together
  - c. The process of quantifying the costs of an action
  - d. The process of subtracting the benefits of an action from its costs
  
2. Which of the following projects is NOT likely to be cost-effective?
  - a. A project that costs \$1 million and protects a wastewater treatment plant serving a large population
  - b. A tornado safe room in an area with high tornado risk
  - c. **A project that costs \$1 million and protects 2 vacation homes\*\*\***
  - d. A project that costs \$1 million and protects a large hospital
  
3. If something has a positive Net Present Value, that means:
  - a. It is a bad investment
  - b. The costs are greater than the benefits
  - c. **It is a good investment\*\*\***
  - d. The value of the asset increases with inflation
  
4. What entity requires that FEMA use a 7% discount rate when doing BCAs for hazard mitigation projects?
  - a. Congress
  - b. **The Office of Management and Budget (OMB)\*\*\***
  - c. The Government Accountability Office (GAO)
  - d. Department of Homeland Security
  
5. What do we mean when we say a project is “cost-effective?”
  - a. **The project’s Benefit-Cost Ratio (BCR) is 1.0 or greater\*\*\***
  - b. The project causes more damages than it avoids
  - c. The project benefits are less than the project’s avoided damages
  - d. The costs of the project are high
  
6. Which of the following may NOT be counted as a benefit in a FEMA BCA?
  - a. Avoided emergency management costs
  - b. Avoided utility loss of function
  - c. **Maintenance costs\*\*\***
  - d. Avoided physical damages
  
7. Why does FEMA require BCAs for most hazard mitigation projects?
  - a. It is the best way to assess local community support for a project.
  - b. **The Stafford Act mandates that FEMA fund cost-effective hazard mitigation projects.\*\*\***
  - c. 2 CFR §200 requires BCAs for all federal grants.
  - d. It is the only way to determine whether a project is eligible.

8. Which of the following subapplications would require a full BCA if applying for an HMA grant?
- Mitigation plan
  - Acquisition in the Special Flood Hazard Area (SFHA) costing less than \$276,000
  - Management costs
  - d. Seismic retrofit\*\*\***
9. What is the correct equation for arriving at the Benefit-Cost Ratio (BCR)?
- a. Benefits/Costs\*\*\***
  - Benefits – Costs
  - Costs/Benefits
  - Costs – Benefits
10. What is FEMA's requirement for cost-effectiveness?
- Costs are greater than the avoided damages
  - b. A Benefit-Cost Ratio (BCR) of 1.0 or greater\*\*\***
  - A Benefit-Cost Ratio (BCR) of 2.0 or greater
  - A positive Benefit-Cost Ratio (BCR)
11. We determine the benefits of a mitigation project by \_\_\_\_\_.
- a. Subtracting the damages after mitigation from the damages before mitigation.\*\*\***
  - Subtracting the damages before mitigation from the damages after mitigation.
  - Subtracting the damages after mitigation from the costs.
  - Subtracting the costs from the damages before mitigation.
12. What is FEMA's BCA Toolkit?
- Software that calculates the Project Useful Life of a hazard mitigation project
  - b. Software that calculates the Benefit-Cost Ratio of a hazard mitigation project\*\*\***
  - FEMA's BCA policy
  - Cost estimating software
13. Environmental benefits may be applied to any of the following project types except:
- Acquisitions
  - Wildfire mitigation
  - Drainage improvement
  - d. Elevations\*\*\***
14. Which of the following project types would have \$0 in damages (i.e. no residual risk) after mitigation?
- Tornado safe room
  - Elevation
  - c. Acquisition\*\*\***
  - Drainage improvement

15. What is the term used to describe the likelihood of a hazard event of specific severity occurring in any given year?
- a. Project useful life
  - b. Discount rate
  - c. Vulnerability
  - d. Recurrence interval\*\*\***
16. Version 6.0 of the BCA Toolkit uses a \_\_\_\_\_ platform.
- a. Microsoft Access
  - b. SQL
  - c. HAZUS
  - d. Microsoft Excel\*\*\***
17. All of the following are key pieces of information you need for a BCA except:
- a. Project cost
  - b. Project effectiveness
  - c. Project schedule\*\*\***
  - d. Project useful life
18. If you are doing a mitigation project at an electrical substation and you do not have documented past damages to the facility, what would be the best choice for Frequency and Damage Relationship?
- a. Historical Damages
  - b. Professional Expected Damages\*\*\***
  - c. Modeled Damages
  - d. Risk-Based Assessment
19. The project useful life for an acquisition is \_\_\_\_\_ years.
- a. 50
  - b. 25
  - c. 100\*\*\***
  - d. 1,000
20. FEMA has developed pre-calculated benefits for all of the following project/hazard types except:
- a. Hurricane wind retrofits
  - b. Post-wildfire mitigation
  - c. Residential tornado safe rooms
  - d. Seismic (earthquake) mitigation\*\*\***
21. A current list of available pre-calculated benefits may be found at:
- a. FEMA's BCA website\*\*\***
  - b. The Emergency Management Institute (EMI) website
  - c. FEMA's Hazard Mitigation Assistance (HMA) Guidance
  - d. FEMA's Public Assistance (PA) website

22. FEMA's BCA Helpline can assist with all of the following except:
- Deciding which Frequency and Damage Relationship option is best for your project
  - Technical issues related to the BCA Toolkit
  - Reviewing your BCA\*\*\***
  - Identifying what data you need to complete your BCA
23. If you are having trouble installing or launching the BCA Toolkit, what is a good resource for assistance?
- FEMA's BCA Helpline\*\*\***
  - Microsoft
  - FEMA's Hazard Mitigation Assistance (HMA) Guidance
  - The Emergency Management Institute (EMI) website
24. When using the Historical Damages methodology, how many past events do you need if you do not know the Recurrence Intervals (RIs) for any of the events?
- 4
  - 3\*\*\***
  - 2
  - 1
25. One of the key drivers of the benefits of a tornado safe room is:
- The occupancy of the safe room\*\*\***
  - The distance to the nearest tornado safe room
  - The distance to the nearest hospital
  - The value of electrical service of the facility
26. All of the following are wind retrofit projects that can be analyzed using Modeled Damages except:
- Shutters
  - Roof retrofit
  - Debris removal\*\*\***
  - Load path
27. Social benefits could be added to which of the following project types?
- Seismic retrofit
  - Residential acquisition or elevation\*\*\***
  - Tornado safe room
  - Flood protection project at a wastewater treatment plant
28. One of the key drivers of the benefits of a wildfire mitigation project is:
- The distance to the nearest hospital
  - The burn recurrence interval\*\*\***
  - The type of basement of the structure
  - The flood risk of the area

29. What are the primary benefits in the BCA of a seismic building retrofit project?
- Avoided physical damages to the structure
  - Increased property value
  - Avoided casualties\*\*\***
  - Environmental benefits
30. When doing a BCA for a generator, which of the following pieces of data is NOT required?
- Project cost
  - Maintenance costs
  - Project effectiveness determined by a qualified professional
  - Number of people in the house\*\*\***
31. Which of the following would NOT be acceptable to include as past damages in a generator project BCA?
- Damages that would be mitigated by the proposed project
  - Damages for which there is no documentation\*\*\***
  - Costs to rent a temporary facility
  - Costs to move to a temporary facility
32. If the BCA Toolkit is not generating a BCR for your project, or the BCR is much lower than you expected, what is the first thing you should do?
- Adjust the project useful life
  - Enter a lower project cost
  - Check to make sure you have entered or selected all required inputs correctly\*\*\***
  - Add environmental and social benefits to your project