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Examination for Evaluation and Repair of Concrete Structures Part 1
Chapters 1 and 2 only

CHAPTER 1 - INTRODUCTION

1. What must be addressed in any concrete repair?
 - a) The symptoms of a deficiency
 - b) The cause of a deficiency
 - c) The observations of a deficiency
 - d) The cost of a deficiency

2. What should be done if the material and methods needed for a repair project are not covered in any existing guide specification?
 - a) A detailed specification should be prepared
 - b) Other materials and methods should be considered
 - c) Similar guide specifications should be used
 - d) A Rehabilitation Evaluation report should be pre-approved

CHAPTER 2 – EVALUATION OF THE CONCRETE IN CONCRETE STRUCTURES

3. What should be the first step in a condition survey?
 - a) Review of design documentation
 - b) Cracking survey
 - c) Visual inspection of exposed concrete
 - d) Nondestructive testing

4. A crack having a width measuring 0.075 inches would be classified as what?
 - a) Surface
 - b) Shallow
 - c) Medium
 - d) Fine

5. What is typically the cause of dusting-type disintegration?
 - a) Freezing and thawing
 - b) Exposure to aggressive water
 - c) Structural overload
 - d) Poor construction practice

6. Cavitation-erosion usually occurs at water velocities greater than what?
 - a) 7.60 m/sec (25 ft/sec)
 - b) 12.2 m/sec (40 ft/sec)
 - c) 9.10 m/sec (30 ft/sec)
 - d) 13.7 m/sec (45 ft/sec)

7. What is one of the most frequent causes of spalling?
 - a) Corrosion of reinforcement
 - b) Freezing and thawing
 - c) Unsatisfactory aggregate particles
 - d) Delamination

8. Delaminations allow heat transfer through concrete?
 - a) True
 - b) False
 - c) Not enough information for a specific answer
 - d) Too many variables for a specific answer

9. A crack comparator can measure crack widths to an accuracy of what?
 - a) About 0.100 mm (0.004 inch)
 - b) About 0.075 mm (0.003 inch)
 - c) About 0.050 mm (0.002 inch)
 - d) About 0.025 mm (0.001 inch)

10. Which of the following is not listed as a recommended item for use in surface mapping?
 - a) A pocket comparator
 - b) A clipboard
 - c) A crack monitor
 - d) A ruler

11. What is the best method for determining the condition of concrete within a structure?
 - a) Nondestructive testing
 - b) Infrared thermography
 - c) Core drilling
 - d) Hammer-sounding

12. Descriptions and information regarding borehole viewing systems can be found where?
- a) ACI 207.3R
 - b) EP 1110-1-10
 - c) CRD-C 26
 - d) ASTM C 823
13. Which of the following is not an advantage of underwater inspections performed by divers?
- a) Relatively inexpensive
 - b) Applicable to a wide variety of structures
 - c) Flexible inspection procedures
 - d) No restrictions on depths and durations
14. Which of the following is a type of unmanned underwater vehicle?
- a) Diver lockout
 - b) Bottom-crawling
 - c) Observation/work bell
 - d) Atmospheric diving suit
15. The high-resolution acoustic mapping system will automatically shut down when wave action causes a roll angle of more than what?
- a) 9 degrees
 - b) 7 degrees
 - c) 5 degrees
 - d) 3 degrees
16. Side-scan sonar can be configured to look downward at horizontal surfaces?
- a) True
 - b) False
 - c) Not enough information for a specific answer
 - d) Too many variables for a specific answer
17. Ultrasonic pulse-echo systems will work to a depth of what?
- a) Approximately 91 meters
 - b) About half a meter
 - c) Up to 300 feet
 - d) Greater than 300 feet
18. Which of the following is not a physical or mechanical test typically performed on concrete cores?
- a) Air content
 - b) Pulse velocity
 - c) Infrared thermography
 - d) Density

19. The number obtained from a rebound hammer can be used to estimate what?
- a) Smoothness
 - b) Uniformity and quality
 - c) Moisture content
 - d) Aggregate size
20. The Windsor Probe yields precise measurements of the in situ strength of concrete?
- a) True
 - b) False
 - c) Not enough information for a specific answer
 - d) Too many variables for a specific answer
21. What is the most widely used method for nondestructive evaluation of in situ concrete?
- a) Windsor probe
 - b) Ultrasonic pulse-echo
 - c) Rebound hammer
 - d) Ultrasonic pulse-velocity
22. The vertical and lateral accuracy of the acoustic mapping system will decrease in depths of water greater than what?
- a) 3 m (10 ft)
 - b) 6 m (20 ft)
 - c) 9 m (30 ft)
 - d) 12 m (40 ft)
23. Which of the following systems is not a CRD or ASTM measurement standard?
- a) Ultrasonic pulse-echo
 - b) Ultrasonic pulse-velocity
 - c) Infrared thermography
 - d) Acoustic mapping system
24. Which of the following void diameters would be detectable by radar at a depth of 0.3 m (1 ft)?
- a) 70 mm
 - b) 65 mm
 - c) 85 mm
 - d) All of the above
25. The cost for a typical radar unit may be what?
- a) Less than \$50K
 - b) Between \$50K and \$100K
 - c) Between \$100K and \$150K
 - d) More than \$150K



Answer Sheet for Evaluation and Repair of Concrete Structures Part 1
 TPDH-00020

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