

***** EXAMINATION *****

CATHODIC PROTECTION SYSTEMS FOR CIVIL WORKS STRUCTURES

1. **A type of cathodic protection system is:**
 - a) sacrificial anode
 - b) negative anode
 - c) positive anode
 - d) bipolar anode

2. **Sacrificial anodes require:**
 - a) an outside power source and excessive maintenance
 - b) very little maintenance
 - c) expensive terminals
 - d) None of the above

3. **Impressed current anodes are made of:**
 - a) electrochemical wear resistant materials
 - b) insoluble alloys
 - c) multiple sacrificial anodes
 - d) metallic alloys

4. **Compared to sacrificial anodes, impressed current anodes have:**
 - a) a lesser number of electrical connections
 - b) are better used with poorly coated structures
 - c) both a and b
 - d) None of the above

5. **The standard for corrosion control of external hydraulic**
 - a) structures is NSPE
 - b) structures is NCEE
 - c) structures is NACE
 - d) structures is IEEE

6. **A professional engineer may deem cathodic protection unnecessary:**
 - a) in chemical disposal lagoons
 - b) in salt water
 - c) in corrosive water
 - d) in noncorrosive water

7. **Test equipment should include:**
 - a) a fresh and calibrated copper-copper-sulfate reference cell
 - b) cabling suitable for immersion use
 - c) sensitivity more than 5 meg-ohms per volt
 - d) All of the above
8. **Adjusting the data collecting and testing system is known as:**
 - a) optimizing
 - b) polarizing
 - c) stabilizing
 - d) normalizing
9. **Research and development allows remote monitoring systems to:**
 - a) increase reliability
 - b) extend service life
 - c) minimize maintenance requirements
 - d) All of the above
10. **Deficiencies of a sacrificial anode system include:**
 - a) current output is limited
 - b) installation is expensive
 - c) maintenance is required
 - d) All of the above
11. **Potential risk of failure in the cathodic disruption system:**
 - a) may be caused by snail darters
 - b) may be caused by red coral
 - c) may be caused by zebra mussels
 - d) may be caused by sting rays
12. **Inspection of the installation of a cathodic protection system**
 - a) is made by an electronic engineer
 - b) is made by an electrical engineer
 - c) is made by a materials engineer
 - d) is made by a corrosion engineer
13. **Restoration of a cathodic protection system is:**
 - a) generally easiest by replacement
 - b) provided by a mitigation plan
 - c) generally too expensive
 - d) will require replacement of all anodes.
14. **Training should be provided for:**
 - a) project designers
 - b) maintenance personnel
 - c) inspectors
 - d) All of the above

15. **Computations for a cathodic protection systems include:**
- a) surface area to be protected
 - b) the amount of flowing water passing the structure
 - c) the type of soil where the structure is situated
 - d) None of the above
16. **The 20-yr design life of a 25.4 x 1000 anode is:**
- a) 2 amps
 - b) 4 amps
 - c) 8 amps
 - d) 9 amps
17. **The current rating for a 20-yr design life for**
- a) anodes 1 inch x 39.4 inches is 2 amps
 - b) anodes 1 inch x 39.4 inches is 4 amps
 - c) anodes 1 inch x 39.4 inches is 8 amps
 - d) anodes 1 inch x 39.4 inches is 9 amps
18. **The amps required per anode for seawater for**
- a) a 0.63 inch x 39.4 inches anode is 15 amps
 - b) a 0.63 inch x 39.4 inches anode is 25 amps
 - c) a 0.63 inch x 39.4 inches anode is 30 amps
 - d) a 0.63 inch x 39.4 inches anode is 50 amps
19. **The total current requirement divided by the average current**
- a) per anode is the amperage
 - b) per anode is the amount of ohms per anode
 - c) per anode is the current
 - d) per anode is the number of anodes
20. **A current of 24 amperes and resistance of 0.5 ohms requires:**
- a) 8 volts
 - b) 12 volts
 - c) 48 volts
 - d) 64 volts

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