

## ***Quiz - The Inspector's Calc's***

*Answer questions on a separate sheet of paper*

1. Most math mistakes are the result of:
  - a. inputting the wrong numbers in the calculator.
  - b. the inspector's failure to write the formula.
  - c. placing the decimal point in the wrong location.
  - d. the inspector's inability to use the calculator.
  
2. When completing a calculation, always:
  - a. highlight the final answer.
  - b. stand up and shout, "Can you believe it, I did it!"
  - c. add the appropriate units. (*ipy, yrs, etc.*)
  - d. move on to the next problem, and do **not** check your work.
  
3. A "mil" is:
  - a. one-thousandth of an inch.
  - b. one-millimeter.
  - c. a speed used in describing corrosion.
  - d. a place where wheat is ground into flour.
  
4. Write the formula for calculating the *Short-Term* corrosion rate.
  
  
  
  
  
  
  
  
  
  
5. Write the formula for calculating the *Long-Term* corrosion rate.
  
  
  
  
  
  
  
  
  
  
6. Write the formula for calculating the *Remaining Life*.
  
  
  
  
  
  
  
  
  
  
7. Convert the date, May 2003 to a number.
  
  
  
  
  
  
  
  
  
  
8. Convert the number 2012.75 to a date (*year and month*).
  
  
  
  
  
  
  
  
  
  
9. In March 1997, a TML was measured at 0.289". In March 2004 the same TML was measured at 0.268". Calculate the *Corrosion Rate*.

The Inspector's Most Important Calculations

10. In October 1995, a TML was measured at 0.435". In February 2003 the same TML was 0.384". Calculate the *Corrosion Rate*.

11. Calculate the controlling *Corrosion Rate* for the following TML.

$t_{\text{minimum}}$	Jan 2003	Jan 1998	Jan 1995	Jan 1993
0.510"	0.560"	0.565"	0.586"	0.600"

12. The controlling *corrosion rate* at a TML is 0.004 ipy. The *current thickness* is 0.332" and the *retirement thickness* is 0.268". Calculate the *Remaining Life* at this TML.

13. Calculate the *Remaining Life* for this TML.

$t_{\text{minimum}}$	Jun 2004	Jun 1999	Jun 1997	Jun 1987
0.228"	0.282"	0.308"	0.315"	0.320"

14. **API 510 students:** For a vessel, the controlling *Corrosion Rate* is 0.006 ipy and the *Remaining Corrosion Allowance* is 0.096". Determine the *Intervals* for the *Internal* and *External Inspections*.

15. **API 570 students:** For a *Class 2* pipe circuit, the controlling *Corrosion Rate* is 0.006 ipy and the *Remaining Corrosion Allowance* is 0.096". Determine the *Intervals* for the *Thickness Measurement* and *External Inspection*.

16. **API 653 students:** For a tank shell, the controlling *Corrosion Rate* is 0.006 ipy and the *Remaining Corrosion Allowance* is 0.096". Determine the *Intervals* for the *Shell Thickness Measurement* and the *External Inspection*.

17. **API 510 students:** The *Remaining Life* of a vessel is 3 years. Determine the *Intervals* for the *Internal* and *External Inspections*.

18. If there are multiple TMLs on an equipment item, which TML controls the *Remaining Life* calculation?
- The TML with the highest short-term corrosion rate.
  - The TML with the highest long-term corrosion rate.
  - The TML with the overall highest corrosion rate.
  - The TML with the lowest remaining corrosion allowance.
  - The TML with the shortest remaining life.

**Thickness Data**

TML #	$t_{\text{minimum}}$	Apr 2003	Aug 2001	May 1996	Jan 1988
1	0.380"	0.422"	0.428"	0.456"	0.480"
2	0.380"	0.433"	0.447"	0.466"	0.478"

19. **API 510 students:** Use the above thickness data for a vessel. Determine the *Interval* and *Next Inspection Date* for the *Internal* and *External Inspections*.
20. **API 570 students:** Use the above thickness data for a *Class 3* piping circuit. Determine the *Interval* and *Next Inspection Date* for the *Thickness Measurement* and *External Inspections*.
21. **API 653 students:** Use the above thickness data for a tank. Determine the *Interval* and *Next Inspection Date* for the *Shell Thickness Measurement* and *External Inspections*.

**Answers to this exam will be provided in class. Or, just e-mail Mark and request the answer key. E-mail address: mark-msts@ev1.net. Note! You don't have to be a MSTs student to receive an answer key.**

