API 570 - PRACTICE QUESTIONS
CLOSED BOOK -

1. API 570 covers inspection, repair, alteration, and rerating procedures for metallic piping systems that _____.

   a. are being fabricated.
   b. does not fall under ASTM B31.3.
   c. have been in-service.
   d. has not been tested.

2. API 570 was developed for the petroleum refining and chemical process industries.

   a. It shall be used for all piping systems.
   b. It may be used, where practical, for any piping system.
   c. It can be used, where necessary, for steam piping.
   d. It may not be used unless agreed to by all parties.

3. API 570 _____ be used as a substitute for the original construction requirements governing a piping system before it is placed in-service.

   a. shall not
   b. should
   c. may
   d. can

4. API 570 applies to piping systems for process fluids, hydrocarbons, and similar flammable or toxic fluid services. Which of the following services is not specifically applicable?

   a. Raw, intermediate, and finished petroleum products.
   b. Water, steam condensate, boiler feed water.
   c. Raw, intermediate, and finished chemical products.
   d. Hydrogen, natural gas, fuel gas, and flare systems.

5. Some of the classes of piping systems that are excluded or optional for coverage under API 570 are listed below. Which one is a mandatory included class?

   a. Water.
   b. Catalyst lines.
   c. Steam.
   d. Boiler feed water.

6. The _____ shall be responsible to the owner-user for determining that the requirements of API 570 for inspection, examination, and testing are met.

   a. Piping Engineer.
   b. Inspector.
   c. Repair Organization.
   d. Operating Personnel.

7. Who is responsible for the control of piping system inspection programs, inspection frequencies, and maintenance of piping?

   a. Authorized Piping Inspector.
   b. Owner-User.
   c. Jurisdiction.
   d. Contractor.

8. An Authorized Piping Inspector shall have the following qualifications. Pick the one that does not belong in this list.

   a. Four years of experience inspecting in-service piping systems.
   b. High school education plus 3 years of experience in the design, construction, repair, operation, or inspection of piping systems.
   c. Two year certificate in engineering or technology plus 2 years of experience in the design, construction, repair, operation, or inspection of piping systems.
   d. Degree in engineering plus one year experience in the design, construction, repair, operation, or inspection of piping systems.

9. Risk Based Inspections include which of the following:

   a. Likelihood assessment.
   b. Consequence analysis.
   c. Operating and Inspection histories.
   d. All of the above.

10. An RBI assessment can be used to alter the inspection strategy provided:

   a. The degradation methods are identified.
   b. The RBI is fully documented.
   c. A third party conducts the RBI.
   d. Both A & B above.

11. Which one of the following is not a specific type of an area of deterioration?

   a. Rectifier performance.
   b. Injection points.
   c. Deadlegs.
   d. Environmental cracking.

12. Injection points subject to accelerated or localized corrosion may be treated as _____.

   a. the focal point of an inspection circuit.
   b. separate inspection circuits.
   c. piping that must be renewed on a regular schedule.
   d. locations where corrosion inhibitors must be used.

13. The recommended upstream limit of inspection of an injection point is a minimum of:

   a. 12 feet or 3 pipe lengths whichever is smaller.
   b. 12 inches or 3 pipe diameters whichever is smaller.
   c. 12 inches or 3 pipe diameters whichever is greater.
   d. 12 feet or 3 pipe lengths whichever is greater.

14. The recommended downstream limit of inspection of an injection point is a minimum of:

   a. second change in flow direction past the injection point, or 25 feet beyond the first change in flow direction whichever is less.
   b. second change in flow direction past the injection point, or 25 feet beyond the first change in flow direction whichever is greater.
   c. second change in flow direction past the injection point, or 25 inches beyond the first change in flow direction whichever is less.
   d. second change in flow direction past the injection point, or 25 inches beyond the first change in flow direction whichever is greater.

15. Select thickness measurement locations (TMLs) within injection point circuits subject to localized corrosion according to the following guidelines. Select the one that **does not** belong.

a. Establish TMLs on appropriate fittings within the injection point circuit.
b. Establish at least one TML at a location at least 25 feet beyond the downstream limit of the injection point.
c. Establish TMLs on the pipe wall at the location of expected pipe wall impingement or injected fluid.
d. Establish TMLs at both the upstream and downstream limits of the injection point circuit.

16. What are the preferred methods of inspecting injection points?

a. Radiography and/or ultrasonics.
b. Hammer test and/or radiograph.
c. Ultrasonics and/or liquid penetrant.
d. Liquid penetrant and/or eddy current.

17. During periodic scheduled inspections, more extensive inspection should be applied to an area beginning _____ upstream of the injection nozzle and continuing for at least _____ pipe diameters downstream of the injection point.

a. 10 inches, 20
b. 12 feet, 10
c. 12 inches, 10
d. 10 feet, 10

18. Why should deadlegs in piping be inspected?

a. API 510 mandates the inspection of deadlegs.
b. Acid products and debris build up in deadlegs.
c. The corrosion rate in deadlegs can vary significantly from adjacent active piping.
d. Caustic products and debris build up in deadlegs.

19. Both the stagnant end and the connection to an active line of a deadleg should be monitored. In a hot piping system, why does the high point of a deadleg corrode and need to be inspected?

a. corrosion occurs due to directed currents set up in the deadleg.
b. erosion occurs due to convective currents set up in the deadleg.
c. corrosion occurs due to convective currents set up in the deadleg.
d. erosion occurs due to directed currents set up in the deadleg.

20. What is the best thing to do with deadlegs that are no longer in service?

a. Ultrasonically inspect often.
b. Radiograph often.
c. Inspect often.
d. Remove them.

21. What are the most common forms of corrosion under insulation (CUI).

a. localized corrosion of nonferrous metals and chloride stress corrosion cracking of carbon steel.
b. localized corrosion of chrome-moly steel and chloride stress corrosion cracking of ferritic stainless steel.
c. localized corrosion of carbon steel and chloride stress corrosion cracking of austenitic stainless steel.
d. localized corrosion of nickel-silicon alloy and caustic stress corrosion of austenitic stainless steel.

22. What climatic area may require a very active program for corrosion under insulation?

a. Cooler northern continent locations.
b. Cooler drier, midcontinent locations.
c. Warmer, marine locations.
d. Warmer drier, desert locations.

23. Certain areas and types of piping systems are potentially more susceptible to corrosion under insulation. Which of the items listed is not susceptible to CUI?

a. Areas exposed to mist overspray from cooling water towers.
b. Carbon steel piping systems that normally operate in-service above 250 degrees but are in intermittent service.
c. Deadlegs and attachments that protrude from insulated piping and operate at a different temperature than the temperature of the active line.
d. Carbon steel piping systems, operating between 250 degrees F and 600 degrees F.

24. What location is subject to corrosion under insulation and inspection contributes to it.

a. Locations where pipe hangers and other supports exist.
b. Locations where insulation has been stripped to permit inspection of the piping.
c. Locations where insulation plugs have been removed to permit piping thickness measurements.
d. Locations where there is damaged or missing insulation jacketing.

25. Soil-to-air (S/A) interfaces for buried piping are a location where localized corrosion may take place. If the buried part is excavated for inspection, how deep should the excavation be to determine if there is hidden damage?

a. 12 to 18 inches.
b. 6 to 12 inches.
c. 12 to 24 inches.
d. 6 to 18 inches.

26. At concrete-to-air and asphalt-to-air interfaces of buried piping without cathodic protection, the inspector should look for evidence that the caulking or seal at the interface has deteriorated and allowed moisture ingress. If such a condition exists on piping systems over _____ years old, it may be necessary to inspect for corrosion beneath the surface before resealing the joint.

a. 8
b. 5
c. 15
d. 10

27. An example of service-specific and localized corrosion is:

a. Corrosion under insulation in areas exposed to steam vents.
b. Unanticipated acid or caustic carryover from processes into non-alloyed piping.
c. Corrosion in deadlegs.
d. Corrosion of underground piping at soil-to-air interface where it ingresses or egresses.

28. Erosion can be defined as:

a. galvanic corrosion of a material where uniform losses occur.
b. removal of surface material by action of numerous impacts of solid or liquid particles.
c. gradual loss of material by a corrosive medium acting uniformly on the material surface.
d. pitting on the surface of a material to the extent that a rough uniform loss occurs.

29. A combination of corrosion and erosion results in significantly greater metal loss than can be expected from corrosion or erosion alone. This type of loss occurs at:

a. high-velocity and high-turbulence areas.
b. areas where condensation or exposure to wet hydrogen sulfide or carbonates occur.
c. surface-to-air interfaces of buried piping.
d. areas where gradual loss of material occurs because of a corrosive medium.

30. Environmental cracking of austenitic stainless steels is caused many times by:

a. exposing areas to high-velocity and high-turbulence streams.
b. excessive cyclic stresses that are often very low.
c. exposure to chlorides from salt water, wash-up water, etc.
d. creep of the material by long time exposure to high temperature and stress.

31. When the inspector suspects or is advised that specific piping circuits may be susceptible to environmental cracking the inspector should:

a. call in a Piping Engineer for consultation.
b. investigate the history of the piping circuit.
c. obtain advise from a Metallurgical Engineer.
d. schedule supplemental inspections.

32. If environmental cracking is detected during internal inspection of pressure vessels, what should the Inspector do?

a. The Inspector should designate appropriate piping spools upstream and downstream of the vessel to be inspected if piping is susceptible to environmental cracking.
b. The Inspector should consult with a Metallurgical Engineer to determine the extent of the problems.
c. The Inspector should review the history of adjacent piping to determine if it has ever been affected.
d. The Inspector should consult with a Piping Engineer to determine the extent of the problems.

33. If external or internal coatings or refractory liners on a piping circuit are in good condition, what should an inspector do?

a. After inspection, select a portion of the liner for removal.
b. The entire liner should be removed for inspection.
c. Selected portions of the liner should be removed for inspection.
d. After inspection, if any separation, breaks, holes or blisters are found, it may be necessary to remove portions of the lining to determine the condition under it.

34. What course of action should be followed if a coating of coke is found on the interior of a large pipe off a reactor on a Fluid Catalytic Cracking Unit.

a. Determine whether such deposits have active corrosion beneath them. If corrosion is present, thorough inspection in selected areas may be required.
b. The coke deposits should be removed from the area for inspection.
c. The coke deposits may be ignored -- the deposits will probably protect the line from corrosion.
d. Consult with a Process Engineer and a Metallurgist on the necessity of removing the coke deposits.

35. Fatigue cracking of piping systems may result from:

a. embrittlement of the metal due to it operating below its transition temperature.
b. erosion or corrosion/erosion that thin the piping where it cracks.
c. excessive cyclic stresses that are often well below the static yield strength of the material.
d. environmental cracking caused by stress corrosion due to the presence of caustic, amine, or other substance.

36. Where can fatigue cracking typically be first detected?

a. At points of low-stress intensification such as reinforced nozzles.
b. At points of high-stress intensification such as branch connections.
c. At points where cyclic stress are very low.
d. At points where there are only bending or compressive stresses.

37. What are the preferred NDE methods for detecting fatigue cracking.

a. Eddy current testing, ultrasonic A-scan testing, and/or possibly hammer testing.
b. Liquid penetrant testing, magnetic particle testing and/or possibly acoustic emission testing.
c. Visual testing, eddy current testing and/or possibly ultrasonic testing.
d. Acoustic emission testing, hydro-testing, and/or possibly ultrasonic testing.

38. Creep is dependent on:

a. time, temperature, and stress.
b. material, product contained, and stress.
c. temperature, corrosive medium, and load.
d. time, product contained, and load.

39. An example of where creep cracking has been experienced in the industry is in the problems experienced with cracking of 1.25% Chrome steels operating at temperatures above _____ degrees F.

a. 500
b. 900
c. 1000
d. 1200

40. Brittle fracture can occur in carbon, low-alloy, and other ferritic steels at or below _____ temperatures.

a. 140 degree
b. ambient
c. 100 degree
d. 30 degree

41. Water and aqueous solutions in piping systems may freeze and cause failure because of the:

a. expansion of these materials.
b. contraction of these materials.
c. constriction of these materials.
d. decrease of these materials.

42. Different types of inspection and surveillance are appropriate depending on the circumstances and the piping system. Pick the one that does not belong in the following list.

a. Internal and external visual inspection.
b. Thickness measurement inspection.
c. Vibrating piping inspection.
d. Chemical analysis inspection.

43. Internal visual inspections are _____ on piping unless it is a large diameter transfer line, duct, catalyst line or other large diameter piping system.

a. the most effective inspection
b. the most useful means of inspection
c. not normally performed
d. the major means of inspection

44. Name an additional opportunity for a normal non-destructive internal inspection of piping.

a. When the piping fails and the interior is revealed.
b. When maintenance asks for an internal inspection.
c. When piping flanges are disconnected.
d. When a fire occurs and the pipe is in the fire.

45. Why is thickness measurement inspection performed?

a. To satisfy jurisdictional requirements.
b. To determine the internal condition and remaining thickness of the piping components.
c. To determine the external condition and amount of deposits inside the piping.
d. To satisfy heat transfer requirements of the piping.

46. Who performs a thickness measurement inspection?

a. The operator or control man.
b. The Inspector or examiner.
c. The maintenance workers or supervisor.
d. The Jurisdiction or OSHA.

47. When corrosion product buildup is noted during an external visual inspection at a pipe support contact area lifting off such supports may be required for inspection. When doing this, care should be:

a. exercised if the piping is in-service.
b. used when determining the course of action.
c. practiced so as not to disturb the supports.
d. taken that a complete record of the problem is made.

48. Qualified operating or maintenance personnel also may conduct external visual inspections, when:

a. satisfactory to the owner-user.
b. acceptable to the inspector.
c. agreeable to the maintenance supervisor.
d. permissible to the operation supervisor.

49. Who would normally report vibrating or swaying piping to engineering or inspection personnel?

a. Operating personnel.
b. Maintenance personnel.
c. Jurisdictional personnel.
d. OSHA personnel.

50. Thermography is used to check for:

a. vibrating sections of the piping system.
b. detecting localized corrosion in the piping system.
c. abnormal thermal expansion of piping systems.
d. hot spots in refractory lined piping systems.

51. Thickness measurement locations (TMLs) are specific_____ along the piping circuit where inspections are to be made.

a. points
b. areas
c. items
d. junctures

52. The minimum thickness at each TML can be located by:

a. electromagnetic techniques.
b. ultrasonic scanning or radiography.
c. hammer testing.
d. MT and/or PT.

53. Where appropriate, thickness measurements should include measurements at each of _____ on pipe and fittings.

a. two quadrants
b. three locations
c. four quadrants
d. six points

54. Where should special attention be placed when taking thickness measurements of an elbow?

a. The outlet end.
b. The inlet end.
c. The inside and outside radius.
d. The sides.

55. TMLs should be marked on inspection drawings and _____ to allow repetitive measurements.

a. on the inspectors notes
b. on a computer system
c. on the piping system
d. on maintenance department charts

56. What is taken into account by an experienced inspector when selecting TML's?

a. The amount of corrosion expected.
b. The patterns of corrosion that would be expected.
c. The number and the cost of reading the TMLs.
d. Whether the TML's are easily accessed.

57. In theory, a piping circuit subject to perfectly uniform corrosion could be adequately monitored with _____ TML/s.

a. 1
b. 2
c. 3
d. 4

58. More TML's should be selected for piping systems with any of the following characteristics:

a. Low potential for creating a safety or environmental emergency in the event of a leak.
b. More complexity in terms of fittings, branches, deadlegs, injection points, etc.
c. Relatively non-corrosive piping systems.
d. Long, straight-run piping systems.

59. Fewer TML's can be selected for piping systems with any of the following characteristics:

a. More complexity in terms of fittings, branches, deadlegs, injection points, etc.
b. Higher expected or experienced corrosion rates.
c. Long, straight-run piping systems.
d. Higher potential for localized corrosion.

60. TML's can be eliminated for piping systems with the following characteristics:

a. Higher potential for creating a safety or environmental emergency in the event of a leak.
b. Low potential for creating a safety or environmental emergency in the event of a leak.
c. Extremely low potential for creating a safety or environmental emergency in the event of a leak.
d. More complexity in terms of fittings, branches, deadlegs, injection points, etc.

61. What is usually the most accurate means for obtaining thickness measurements on installed pipe larger than NPS 1?

a. MT
b. UT
c. PT
d. ET

62. What thickness measuring technique does not require the removal of some external piping insulation?

a. AE
b. UT
c. ET
d. RT

63. When ultrasonic thickness measurements are taken above _____ degrees F., instruments couplants, and procedures should be used that will result in accurate measurements at the higher temperature.

a. 150
b. 175
c. 200
d. 250

64. Typical digital thickness gages may have trouble measuring thicknesses less than ____ inches.

a. 0.2188
b. 0.1875
c. 0.1562
d. 0.1250

65. When pressure testing of piping systems are conducted they shall be performed in accordance with the requirements of:

a. ASME B31.3.
b. ASME B&PV Code, Section VIII.
c. ASA B16.5
d. API 510

66. If a lower pressure test (lower than prescribed by code) is used only for tightness of piping systems, the _____ may designate the pressure.

a. owner-user
b. inspector
c. jurisdiction
d. contractor

67. The preferred medium for a pressure test is _____.

a. steam
b. air
c. water
d. hydrocarbon

68. If a non-toxic hydrocarbon (flammable) is used as the test medium, the liquid flash point shall be at least _____ degrees F. or greater.

a. 95
b. 100
c. 110
d. 120

69. Piping fabricated of or having components of 300 series stainless steel should be tested with _____.

a. water with a pH of 4
b. water with a pH of 6.
c. water with a chloride content of less than 400 ppm chlorides.
d. steam condensate.

70. For sensitized austenitic stainless steel piping subject to polythionic stress corrosion cracking, consideration should be given to using _____ for pressure testing.

a. an acidic-water solution
b. an alkaline-water solution
c. a water with a pH of 5
d. a water with a pH of 4

71. When a pipe requires post weld heat treatment, when should the pressure test be performed.

a. During heat treatment.
b. Before any heat treatment.
c. After any heat treatment.
d. No test is required.

72. During a pressure test, where the test pressure will exceed the set pressure of the safety relief valve or valves on a piping system the safety relief valve or valves should be _____ when carrying out the test.

a. altered by screwing down on the adjusting screw
b. reset to exceed the test pressure
c. checked or tested
d. removed or blanked

73. If block valves are used to isolate a piping system for a pressure test, what precaution should be taken?

a. Do not use a globe valve during a test.
b. Make sure the packing gland of the valve is tight.
c. Do not exceed the permissible seat pressure of the valve.
d. Check the bonnet bolts to make sure they are tight.

74. Several methods may be used to verify that the correct alloy piping is in a system. Pick the incorrect method from the list below.

a. holography
b. optical spectrographic analyzer
c. X-ray fluorescent analyzers
d. chemical spot checking

75. Name a part of a piping system that thickness measurements are not normally routinely taken.

a. elbows
b. expansion loops
c. tees
d. valves

76. If environmental cracking is found during in-service inspection of welds, who assess' the problem?

a. Owner-user.
b. Inspector.
c. Piping Engineer.
d. Metallurgist.

77. If an Inspector finds an imperfection in an original fabrication weld and analysis is required to assess the impact of the weld quality on piping integrity, which of the following may perform the analysis?

a. An API 510 Inspector, a WPS Inspector, a Pressure Vessel Engineer.
b. An API 570 Inspector, a CW Inspector, a Piping Engineer.
c. An Owner-User, a B31.3 Inspector, an Industrial Engineer.
d. A Jurisdictional Representative, a API 574 Inspector, an Chemical Engineer.

78. According to API 570, some welds in a piping system that has been subjected to radiography according to ASME B31.3:

a. will meet random radiograph requirements, and will perform satisfactorily in-service without a hydrotest.
b. will not meet random radiograph requirements, and will not perform satisfactorily in-service even though hydrotested.
c. will meet random radiograph requirements, and will not perform satisfactorily in-service after a hydrotest.
d. will not meet random radiograph requirements, but will still perform satisfactorily in-service after being hydrotested.

79. How should fasteners and gaskets be examined to determine whether they meet the material specifications.

a. All fasteners and gaskets should be checked to see if their markings are correct according to ASME and ASTM standards.
b. A representative sample of the fasteners and gaskets should be checked to see if their markings are correct according to ASME and ASTM standards.
c. Purchase records of all fasteners and gaskets should be checked to see if the fasteners and gaskets meet ASME and ASTM standards.
d. A representative sample of the purchase records of fasteners and gaskets should be checked to see if the fasteners and gaskets meet ASME and ASTM standards.

80. When checking flange and valve bonnet bolts for corrosion, what type of NDT is usually used?

a. RT
b. UT
c. VT
d. AE

81. What course of action is called for when an inspector finds a flange joint that has been clamped and pumped with sealant?

a. Disassemble the flange joint; Renew the fasteners and gaskets. The flanges may also require renewal or repair.
b. Renew all the fasteners and renew the gasket if leakage is still apparent.
c. Check for leakage at the bolts; if repumping is contemplated, affected fasteners should be renewed.
d. No action is required since the joint has been pumped with a sealant.

82. All process piping systems must be categorized into different classes. On what are the classifications selection based?

a. Requirements of jurisdiction and the proximity of population areas.
b. Potential safety and environmental effects should a leak occur.
c. Liability to the owner-user and the requirements of the jurisdiction.
d. Access to the systems for inspection and closeness to population areas.

82. (1). Inspection strategy based on likelihood and consequence of failure is called:

a. RBI
b. FFS
c. BIR
d. MSOS

82. (2). An RBI assessment can be used to _____ the inspection interval limits in Table 1 of API 570 or the extent of the inspection conducted.

a. increase
b. decrease
c. either a or b, above
d. none of the above

82. (3). When an RBI assessment is used to increase or decrease inspection intervals, the assessment shall be conducted on Class 1 systems at a maximum interval of _____ years.

a. 5
b. 10
c. 15
d. 3

83. Listed below are several examples of a CLASS 1 piping system. Which one does not belong?

a. Anhydrous hydrogen chloride.
b. Hydrofluoric acid.
c. Piping over or adjacent to water and piping over public throughways.
d. Distillate and product lines to and from storage and loading.

84. Of the three classification of piping systems, which includes the majority of unit process and selected off-site piping?

a. Class 3
b. Combination of classes 1 and 2
c. Class 1
d. Class 2

85. Class 3 piping is described as being in services:

a. with the highest potential of resulting in an immediate emergency if a leak occurs.
b. that are flammable but do not significantly vaporize when they leak and are not located in high-activity areas.
c. that are not flammable and pose no significant risk to populated areas.
d. that are not in classes 1 and 2.

86. Who establishes inspection interval for thickness measurements, external visual inspections and for internal and supplemental inspections?

a. Piping Engineer.
b. Owner-user or the Inspector.
c. Chemical Engineer.
d. Piping Engineer and the Jurisdiction.

87. Thickness measurement inspection should be scheduled based on the calculation of not more than:

a. one half the remaining life determined from corrosion rates or the maximum interval of 5 years whichever is shorter.
b. one half the remaining life determined from corrosion rates or the maximum interval allowed by API 570 in Table 1, whichever is shorter.
c. one fourth the remaining life determined from corrosion rates or the maximum interval of 10 years whichever is shorter.
d. one quarter the remaining life determined from corrosion rates or the maximum interval allowed by API 570 in Table 1, whichever is shorter.

88. For External inspections for potential corrosion under insulation (CUI) on Class 1 systems, the examination should include at least _____ percent of all suspect areas and _____ percent of all areas of damaged insulation.

a. 50, 75
b. 50, 33
c. 75, 50
d. 25, 10

89. Piping systems that are known to have a remaining life of over _____ years or that are protected against external corrosion need not have insulation removed for the periodic external inspection.

a. 10
b. 15
c. 5
d. 20

90. For Class 3 piping systems, the examination for corrosion under insulation (CUI) should include at least _____ percent of all suspect areas.

a. 50
b. 30
c. 10
d. 0

91. For Class 2 piping, the extent of CUI inspections on a system operating at -45°F will be:

a.75% of damaged areas, 50% of suspect areas.
b. 50% of suspect areas, 33% of damaged areas.
c. 33% of damaged areas, 50% of suspect areas.
d. none of the above.

92. Small bore piping (SBP) that is Class 1 shall be inspected:

a. where corrosion has been experienced.
b. at the option of the inspector.
c. to the same requirements as primary process piping.
d. only if it has dead legs.

93. Inspection of small bore piping (SBP) that is secondary and auxiliary (associated with instruments and machinery) is:

a. only required where corrosion has been experienced.
b. optional.
c. only if it has dead legs.
d. only if it is threaded.

94. If an inspector finds threaded small bore piping (SBP) associated with machinery and subject to fatigue damage, he should:

a. plan periodically to assess it and consider it for possible renewal with a thicker wall or upgrade it to welded components.
b. inspect it only if it is corroded and the class of service requires an inspection.
c. call for dismantling the threaded joints for close inspection to determine if any cracks are in the roots of the threads.
d. have all the threaded piping renewed at each inspection period.

95. An eight inch diameter piping system is installed December, 1979. The installed thickness is measured as 0.34". The minimum thickness of the pipe is 0.20". It is inspected 12/83 and the thickness is found to be 0.32". An inspection 12/87 reveals a loss of 0.01" from the 12/85 inspection. During 12/89 the thickness was found to be 0.29". The last inspection was during 12/95 and the thickness was found to be 0.26". What is the long term corrosion rate of this system?

a. 0.005"/year
b. 0.0075"/year
c. 0.00375"/year
d. 0.0025"/year

96. Using the information in question 95, calculate the short term corrosion rate.

a. 0.005"/year
b. 0.0075"/year
c. 0.00375"/year
d. 0.0025"/year

97. Using the information in questions 95 and 96, determine the remaining life of the system.

a. 18 years
b. 15 years
c. 12 years
d. 6 years

98. You have a new piping system that has just been installed. It is completely new an no information exists to establish a corrosion rate. Also, information is not available on a similar system. You decide to put the system in service and NDT it later to determine the corrosion rate. How long do you allow the system to stay in service before you take your first thickness readings?

a. 1 month
b. 3 months
c. 6 months
d. 12 months

99. After an inspection interval is completed and if calculations indicate that an inaccurate rate of corrosion has been assumed in a piping system, how do you determine the corrosion rate for the next inspection period?

a. Check the original calculations to find out what the error is in the original assumption.
b. Unless the corrosion rate is higher, the initial rates shall be used.
c. The corrosion rate shall be adjusted to agree with the actual rate found.
d. If the corrosion rate is higher than originally assumed, call in a corrosion specialist.

100. If a piping system is made up of unknown materials and computations must be made to determine the minimum thickness of the pipe, what can the inspector or the piping engineer do to establish the minimum thickness?

a. The lowest grade material and joint efficiency in the applicable code may be assumed for calculations.
b. Samples must be taken from the piping and testing for maximum tensile stress and yield strength will determine the allowable stress to be used.
c. The piping made of the unknown material must be removed from service and current piping of known material must be installed.
d. The piping of unknown material may be subjected to a hydrostatic stress tests while having strain gages on it to determine its yield strength and thus allowable stress.

OPEN BOOK QUESTIONS

101. A seamless NPS 10 pipe, ASTM A106 Gr. B material, operates at 750 psi and 700 degrees F. (maximum). Considering only pressure design thickness for straight pipe, what minimum thickness is required?

a. 0.24"
b. 0.20"
c. 0.28"
d. 0.17"

102. A seamless NPS 10 pipe, ASTM A106 Gr. B material, operates at 750 psi and 700 degrees F. (maximum). The thickness of the pipe as determined by the last inspection is 0.30". The pipe has been in service for 10 years. The original thickness (measured when installed) was 0.365". Two years previous to the 0.30" measurement the thickness of the pipe was measured to be 0.31". Determine the greatest corrosion rate, i.e., short or long term.

a. 0.0050 inches per year
b. 0.0065 inches per year
c. 0.0100 inches per year
d. 0.0130 inches per year

103. A seamless NPS 10 pipe, ASTM A106 Gr. B material, operates at 750 psi and 700 degrees F. (maximum). The thickness of the pipe as determined by the last inspection is 0.30". The pipe has been in service for 10 years. The original thickness (measured when installed) was 0.365". Two years previous to the 0.30" measurement the thickness of the pipe was measured to be 0.31". The next planned inspection is scheduled for 7 years. Using the worst corrosion rate (short or long term) determine what pressure the pipe will withstand at the end of its next inspection period?

a. 920 psi
b. 663 psi
c. 811 psi
d. 750 psi

104. A piping engineer is designing a piping service with high potential consequences if a failure occurs, i.e., a 350 psi natural gas line adjacent to a high density population area. What should he consider doing to provide for unanticipated situations?

a. Have all his calculations checked twice.
b. Increase the required minimum thickness.
c. Notify the owner-user and the jurisdiction.
d. Set up an emergency evacuation procedure.

105. When evaluating locally thinned areas, "the surface of the weld includes _____ inch on either side of the weld or _____ times the minimum measured thickness on either side of the weld, whichever is greater.

a. 0.5", 3
b. 1" , 2
c. 2" , 1
d.1.5", 1.5

106. An Inspector finds a thin area in a fabricated 24" diameter pipe. The thin area includes a longitudinal weld in the pipe and is 10 feet long and 2 foot circumferentially. Calculations show that with 0.85 joint factor, the pipe must be repaired, renewed, etc. or the pressure in the pipe must be lowered. The owner does not want do any hot work on the pipe and he does not wish to lower the pressure. What other course could you follow?

a. Write the results of the inspection up and leave it with the owner.
b. Radiograph the weld 100% and increase the joint factor to one.
c. Insist that the weld be repaired or renewed or that the pressure be lowered.
d. Call in a regulatory agency to force the owner to repair, renew, etc. the line.

107. Piping stress analysis is done during the system's original design. How can the inspector make use of stress analysis information?

a. An inspector can not use this information. It is only meaningful to a piping engineer.
b. It can be used to make sure the piping system was originally evaluated and designed correctly.
c. It can be used to concentrate inspection efforts at locations most prone to fatigue or creep damage, and to solve vibration problems
d. The inspector should use this information to evaluate the need for conducting additional piping stress analysis.

108. You are inspecting a piping system. You find a significant loss of material (a major increase of corrosion rate) in gas oil piping (used as reboiler oil, temperature 500 degrees F.) on an Fluid Catalytic Cracking Unit. What is the best course of action for you to take?

a. The losses may be reported to your supervisor for corrective response.
b. The losses should be recorded & reported in your final report after the unit has started.
c. It shall be reported to the owner-user for appropriate action.
d. Replace excessively thin piping & note replacement in the final report after unit start-up.

109. The _____ shall maintain appropriate permanent and progressive records of each piping system covered by API 570.

a. inspector
b. owner-user
c. jurisdiction
d. examiner

110. When making repairs and alterations to piping systems the principles of _____ or the code to which the piping system was built shall be followed.

a. ASME B31.3
b. API 570
c. API 574
d. ASME B&PV Code

111. Repair and alteration work must be done by a repair organization as defined in API 570 and must be authorized by the _____ prior to its commencement.

a. jurisdiction
b. inspector
c. owner-user
d. examiner

112. Authorization for alteration work to a piping system may be given by the inspector after:

a. notifying the jurisdiction and getting their approval.
b. consulting API 570 and getting the approval of the owner-user.
c. consultation with, and approval by a piping engineer.
d. discussing with, and consent by an examiner.

113. A repair procedure involving welding requires that the root pass of the weld be inspected before continuing the weld. A "hold" on the repair is required at this point. Who designates this "hold"?

a. A metallurgist.
b. The owner-user.
c. An API 570 inspector.
d. The welder Supervisor.

114. What type of repairs and procedures may the inspector give prior general authorization to continue (provided the inspector is satisfied with the competency or the repair organization?

a. major repairs and minor procedures.
b. limited or routine repairs and procedures.
c. alterations and reratings.
d. minor reratings and alterations.

115. Who approves all proposed methods of design, execution, materials, welding procedures, examination, and testing of in-service piping?

a. The jurisdiction or the piping engineer as appropriate.
b. The analyst and the operator as appropriate.
c. The examiner and the piping programmer as appropriate.
d. The inspector or the piping engineer, as appropriate.

116. Who must give approval for any on-stream welding?

a. owner-user.
b. jurisdiction.
c. examiner.
d. analyst.

117. An inspector finds a crack in the parent metal of a pipe adjacent to a support lug. The pipe was being inspected after a 5 year run. Before repairing the he should:

a. Notify the jurisdiction prior to the start of any repairs.
b. Write a detailed procedure for the repair organizations use in repairing the crack.
c. Consult with the piping engineer to identify and correct the cause of the crack.
d. Consult with a metallurgist prior to writing a procedure to repair the crack.

118. A full encirclement welded split sleeve designed by a piping engineer may be applied over a damaged or corroded area of a pipe. This is considered a temporary repair. When should a permanent repair be made?

a. If the owner-user designates the welded split sleeve as permanent, it may remain.
b. A full encirclement welded split sleeve is permanent if okayed by the inspector.
c. A full encirclement welded split sleeve is considered a permanent repair.
d. A permanent repair must be made at the next available maintenance opportunity.

119. What type of defect, corrosion, pitting and/or discontinuity should not be repaired by a full encirclement welded split sleeve?

a. A longitudinal crack.
b. A circumferential crack.
c. Pits that are one half through wall.
d. General corrosion in the longitudinal direction.

120. If a repair area is localized (for example, pitting or pin-holes) and the specified minimum yield strength (SMYS) of the pipe is not more than _____ psi, a temporary repair may be made by fillet welding a properly designed plate patch over the pitted area.

a. 30,000 psi
b. 55,000 psi
c. 40,000 psi
d. 36,000 psi

121. Insert patches (flush patches may be used to repair damaged or corroded areas of pipe if several requirements are met. One of these is that an insert patch (flush patch) may be of any shape but it shall have rounded corners with _____ minimum radii.

a. 0.375"
b. 0.50"
c. 0.75"
d. 1"

122. An inspector finds a pin-hole leak in a weld during an on-stream inspection of a piping system. A permissible temporary repair is:

a. the use of plastic steel to seal off the leak.
b. driving a wooden plug into the hole.
c. screwing a self tapping screw into the hole.
d. the installation of a properly designed and fabricated bolted leak clamp.

123. Temporary leak sealing and leak dissipating devices shall be removed and the pipe restored to original integrity:

a. as soon as the piping system can be safely removed from service.
b. at a turnaround or other appropriate time.
c. when the leak seal and leak dissipating device ceases to work.
d. as soon as possible--must be done on a safe, emergency shut-down basis.

124. Which of the following is **NOT** an item for consideration by an inspector when a leak sealing fluid ("pumping") is used for a temporary leak seal repair.

a. Consider the compatibility of the sealant with the leaking material.
b. Consider the pumping pressure on the clamp (especially when repumping).
c. Consider the pressure testing of the piping in question.
d. Consider the number of times the seal area is repumped.

125. Any welding conducted on piping components in operation must be done in accordance with:

a. NFPA 704
b. API Standard 510.
c. ASME B31.3.
d. API Publication 2201.

126. All repair and alteration welding to piping systems shall be done in accordance with the:

a. exact procedures of ASME B31.3 or to the code to which it was built.
b. standards of ASME B31.1 or the code to which it was built.
c. principles of ASME B31.3 or the code to which it was built.
d. ideals of ASME, NBIC, or API standards.

127. Welders and welding procedures used in making piping repairs, etc. shall be qualified in accordance with:

a. ASME B31.3 or the code to which the piping was built.
b. NBIC or the system to which the piping was built.
c. NACE or the method to which the piping was built.
d. ASTM or the law to which the piping was built.

128. The repair organization responsible for welding shall maintain records of welding procedures and welder performance qualifications. These records shall be available to the inspector:

a. at the end of the job.
b. after the start of welding.
c. following the start of welding.
d. before the start of welding.

129. Preheating to not less than _____ degrees F. may be considered as an alternative to post weld heat treatment for alterations or repairs of P-1 piping initially post weld heat treated as a code requirement (may not be used if the piping was post weld heat treated due to environmental cracking prevention).

a. 150
b. 200
c. 300
d. 350

130. When using local PWHT as a substitute for 360-degree banding on local repairs of PWHT'd piping, which of the following items is **NOT** considered?

a. The application is reviewed, and a procedure is developed by the piping engineer.
b. The locally PWHT'd area of the pipe must be RT'd or UT'd
c. A preheat of 300^0 F., or higher is maintained while welding.
d. The PWHT is performed for code compliance and not for environmental cracking.

131. Piping butt joints shall be:

a. double spiral fillet welds
b. single fillet lap welds.
c. double fillet lap welds.
d. full-penetration groove welds.

132. When should piping components that need repair be replaced?

a. When enough time remains on a turnaround to allow replacement.
b. When repair is likely to be inadequate.
c. When the cost of repair is as high as renewal.
d. When replacement is preferred by maintenance personnel.

133. Fillet welded patches (lap patches) shall be designed by:

a. an engineer.
b. the inspector.
c. the piping engineer.
d. the repair organization.

134. Fillet welded lap patches (overlay patches) shall have:

a. no membrane stresses.
b. right-angled corners.
c. rounded corners.
d. burnished corners.

135. Materials used in making welding repairs or alterations _____ be of known weldable quality.

a. may
b. shall
c. should
d. can

136. Acceptance of a welded repair or alteration shall include _____ in accordance with the applicable code and the owner-user's specification, unless other wise specified in API 570.

a. Nominal pragmatic sizing (NPS)
b. NBE
c. safeguards
d. Nondestructive examination

137. After welding is completed on a repair or alteration, _____ in accordance with API 570 shall be performed if practical and deemed necessary by the inspector

a. NPS
b. safety sanctions
c. NBE
d. a pressure test

138. When are pressure tests normally required?

a. Pressure tests are normally required after alterations and any repair.
b. Pressure tests are normally required after alterations and major repairs.
c. Pressure tests are normally required after major and minor repairs.
d. Pressure tests are normally required only as specified by the owner-user.

139. When a pressure test is not necessary or practical, what shall be utilized in lieu of a pressure test?

a. NPS
b. Nondestructive examination.
c. Vacuum visual examination.
d. NBE

140. Special procedure in place of a pressure test after an alteration or repair may be done only after consultation with:

a. the operators and the repair organization.
b. the inspector and the piping engineer.
c. the jurisdiction.
d. the examiner and the inspector.

141. When it is not practical to perform a pressure test of a final closure weld that joins a new or replacement section of piping to an existing system, several requirements shall be satisfied. Which of the following is **NOT** one of the requirements.

a. The closure weld is a full-penetration fillet weld between a weld neck flange and standard piping component or straight sections of pipe of equal diameter and thickness, axially aligned, and of equivalent materials. For design cases up to Class 150 and 500^0 F., slip-on flanges are acceptable alternates.
b. MT or PT shall be performed on the root pass and the completed butt weld. Fillet welds must have PT/MT on the completed weld.
c. The new or replacement piping is pressure tested.
d. Any final closure butt weld shall be of 100 % radiographic quality; or angle-beam UT may be used, provide the appropriate acceptance criteria is established.

142. Which of the following is **NOT** a requirement for rerating a piping system by changing the temperature or the MAWP.

a. The existing pressure relieving devices are still in place & set as they were originally.
b. Calculations are performed by the piping engineer or the inspector.
c. Piping flexibility is adequate for design temperature changes.
d. A decrease in minimum operating temperature is justified by impact test results, if required by the applicable code.

143. Why is inspection of buried process piping (not regulated by DOT)different from other process piping inspection?

a. The insulating effect of the soil increases the possibility of more internal corrosion.
b. Internal corrosion has to be controlled by cathodic protection.
c. Significant external deterioration can be caused by corrosive soil conditions.
d. Internal corrosion must be controlled by internal coatings.

144. Indications of leaks in buried piping may include several indications. Which of the ones listed below is **NOT** one of the indications.

a. A change in the surface contour of the ground.
b. Water standing on the pipeline right-of-way.
c. Discoloration of the soil.
d. Notice odor.

145. Corrosion cells can form on both bare and coated pipe where bare steel contacts the soil. How can these cells be detected?

a. Run an acoustic emission test on the piping.
b. Visually survey the route of buried piping.
c. The potential at the area of corrosion will be measurable different than other areas and a close-interval potential survey can detect the location of corrosion.
d. Run a internal survey of the piping using a video camera.

146. A pipe coating holiday survey is used to locate coating defects on coated pipes. It can be used on newly constructed pipe systems to ensure that the coating is intact and holiday-free. More often it is used on buried pipe to:

a. show the measurable differences in electrical potential in corroded areas.
b. evaluate coating serviceability for buried piping that has been in-service for a long time.
c. determine the depth of the piping for resistivity testing.
d. evaluate the cathodic protection components of the under-ground pipe.

147. Cathodically protected buried piping should be monitored _____ to assure adequate levels of protection.

a. regularly
b. intermittently
c. erratically
d. frequently

148. If an "intelligent pigging" system is used to inspect buried piping, what type of bends are usually required in the piping system?

a. Five diameter bends.
b. 90 degree pipe ells.
c. Ten diameter bends.
d. Three diameter bends.

149. How often should above-grade visual surveillance of a buried pipeline right-of-way be made?

a. Once a month.
b. Approximately 6 month intervals.
c. Once a year.
d. Once every 3 months.

150. How often should poorly coated pipes with inconsistent cathodic protection potentials have a pipe-to-soil potential survey made?

a. Yearly.
b. Every 2 years.
c. Every 5 years.
d. Every 7 years.

151. On buried piping, what is the frequency of pipe coating holiday surveys?

a. The frequency is governed by the leak test interval of the pipe.
b. It is usually based on indications that other forms of corrosion control are ineffective.
c. Surveys are normally made every 5 years.
d. Pipe coating holiday surveys are made when the pipe is excavated.

152. For piping buried in lengths greater than _____ feet and not cathodically protected, evaluation of soil corrosivity should be performed at 5-year intervals.

a. 50
b. 75
c. 100
d. 150

153. If buried piping is cathodically protected, the system should be monitored at intervals in accordance with Section 10 of NACE RP0169 or Section 9 of API RP 651. API RP 651 specifies _____ interval.

a. annual
b. biannual
c. biennial
d. triennial

154. Buried piping inspected periodically by excavation shall be inspected in lengths of _____ feet at one or more locations judged to be most susceptible to corrosion.

a. 2 to 4
b. 4 to 6
c. 6 to 8
d. 8 to 10

155. After excavation of buried piping, if inspection reveals damaged coating or corroded piping:

a. the condition should be noted in the records and the inspection interval shortened.
b. the complete piping system must be daylighted (excavated) for repair or replacement.
c. the damaged coating or corroded piping must be repaired or replaced.
d. additional piping shall be excavated until the extent of the condition is identified.

156. If buried piping is contained inside a casing pipe, the casing should be:

a. capable of caring the same pressure as the product pipe.
b. checked to see if its protective coating is intact and serviceable.
c. pressure tested to make sure it is serviceable.
d. inspected to determine if water and/or soil has entered the casing.

157. An alternative or supplement to inspection of buried piping is leak testing with liquid at a pressure at least ____ % greater than the maximum operating pressure at intervals 1/2 the length of those shown in Table 3 of API 570 for piping <u>not</u> cathodically protected and at the same intervals as shown in Table 3 for cathodically protected piping.

a. 5
b. 10
c. 25
d. 50

158. The leak test for buried piping should be for a period of _____ hours.

a. 4
b. 8
c. 12
d. 24

159. The leak test for a 8" diameter buried piping system is 300 psi. After 7 hours, the pressure reads 273 psi. What should the inspector do?

a. Nothing is required. The loss of pressure is negligible and will not affect the test. The loss can be disregarded.
b. The system should be repressured to the original leak test pressure and the test should begin again.
c. The test charts and the temperature should be reviewed to determine if any change in temperature caused the pressure drop.
d. The piping should be visually inspected externally and/or inspected internally to find the leak and assess the extent of corrosion.

160. A buried piping system that is not cathodically protected has to have an inspection interval set. The soil resistivity is checked and found to be 3400 ohm-cm. As the inspector, what interval of would you set?

a. 2.5 years
b. 7.5 years
c. 5 years
d. 10 years

161. Buried piping also may be surveyed for integrity by removing the line from service and performing a leak test. This inspection method typically involves pressurizing the line with a _____, allowing time for the _____ to diffuse to the surface, and surveying the buried line with a gas-specific detector to detect the _____.

a. tracer gas (such as helium or sulfur hexafluoride)
b. light hydrocarbon (such as butane)
c. smoke type material (such as chemical smoke)
d. water vapor (such as steam)

162. Repairs to coatings on buried piping may be tested using:

a. a low-voltage holiday detector.
b. light taps with a inspection hammer.
c. an flaw indicator fluid.
d. a high-voltage holiday detector.

163. If buried piping leaks are clamped and reburied,:

a. no further action is required unless the piping leaks again.
b. the date of installation shall be marked on the clamp for future identification.
c. a record of the location and the date of installation shall be maintained.
d. the clamped line shall be leak tested.

164. A 10" diameter piping system with 4" diameter and 6" diameter reinforced branch connections is to have changes made to it. Which of the following is considered an alteration?

a. A new 1" diameter unreinforced nipple is installed.
b. A new 8" diameter reinforced branch connection is installed.
c. A new 4" diameter reinforced branch connection is installed.
d. A new 3" diameter reinforced branch connection is installed.

165. Which of the following **would not** be classified as an applicable code to which a piping system was built?

a. ASME B31.3
b. ASME B31.1
c. ASA B31.1-1955, Section 3
d. ASTM A-20

166. Which of the inspection agencies listed below is **NOT** *an authorized inspection agency* as defined in API 570?

a. Jurisdictional inspection organization.
b. Owner-user inspection organization.
c. ASTM inspection organization
d. Independent inspection organization.

167. An *authorized piping inspector* is an employee of an authorized inspection agency who is qualified to perform the functions specified in API 570. Which individual listed below is **not** usually an *authorized piping inspector.*

a. An owner-user inspector.
b. A jurisdictional inspector
c. An NDE examiner.
d. An insurance inspector.

168. Which of the following qualifies as *auxiliary piping*?

a. control valve manifolds
b. bypass lines around exchangers
c. pump seal oil lines
d. orifice runs.

169. CUI stands for:

a. control unit inspector
b. corrosion under insulation
c. corrected unobtrusive inserts
d. corroded underground installation

170. Deadlegs legs of a piping system are:

a. the upstream piping of control valve manifolds.
b. supports attached to a pipeline that has no product in them.
c. the upstream part of an orifice runs.
d. sections that normally have no significant flow.

171. A defect is an imperfection of a type or magnitude exceeding the _____ criteria.

a. nonspecific
b. imprecise
c. general
d. acceptable

172. The design temperature of a piping system component is the temperature at which, under the coincident pressure, the _____ is required.

a. smallest thickness or highest component rating
b. greatest thickness or highest component rating
c. maximum thickness or lowest component rating
d. minimum thickness or minimum component rating

173. An examiner is a person who _____ the inspector.

a. supplants
b. assists
c. supervises
d. directs

174. Hold point is a point in the repair or alteration process beyond which work may not proceed until the _____ _____ has been performed and documented.

a. PWHT required
b. required inspection
c. RT required
d. ultrasonic testing

175. What is an imperfection?

a. It is a flaw or discontinuity noted during inspection that may be subject to acceptance.
b. It is a defect noted during inspection that is unacceptable.
c. It is a weld flaw noted during an inspection that may be subject to repair.
d. It is a blemish that is only cosmetic and acceptable under all conditions.

176. _____ : is a response or evidence resulting from the application of a nondestructive evaluation technique.

a. indication
b. imperfection
c. breach
d. division

177. What are points where chlorine is introduced in reformers, water is added in overhead systems, etc. called.

a. primary process points
b. level bridle points
c. injection points
d. test points

178. What is the loss of ductility and notch toughness in susceptible low-alloy steels such as 1.25 and 2.5 Cr., due to prolonged exposure to high-temperature service called?

a. creep
b. temper embrittlement
c. incipient melting
d. graphitization

179. Secondary process piping is small-bore (less than or equal to _____) process piping downstream of normally closed block valves.

a. NPS 3/4
b. NPS 1
c. NPS 2
d. NPS 3

180. A test point is an area defined by a circle having a diameter not greater than _____ inches for a line diameter not exceeding 10 inches or not greater than _____ inches for larger lines.

a. 3, 4
b. 2, 3
c. 1, 2
d. 3/4, 1

181. When making a repair utilizing a welded full encirclement repair sleeve and the sleeve material is different from the pipe material, you should:

a. consult the piping engineer.
b. use a weld rod matching the higher strength material.
c. use a weld rod matching the lower strength material.
d. use a alloy weld rod such as Inco-A.

182. What type of electrode should be used when welding a full encirclement repair sleeve?

a. low-hydrogen electrode
b. low-phosphorus electrode
c. low-chrome electrode
d. low-nitrogen electrode

183. Which of the following welding electrodes is low-hydrogen?

a. E6010
b. E7016
c. E7011
d. E7014

184. When welding a small repair patch, the diameter of electrodes used should not exceed:

a. 1/8"
b. 3/16"
c. 5/32"
d. 1/4"

185. A 14" O.D. pipe has a corroded area on it. What is the maximum size of a small repair patch that may be used to cover the corroded area?

a. 3.5"
b. 7"
c. 6"
d. 6.5"

186. A NPS 4 Schedule 80 (0.337" wall) branch is welded into a NPS 12 Schedule 40 (0.406" wall) header. What size cover fillet weld (t_c) is required over the full penetration groove weld? (Express answer to nearest hundreth)

a. 0.578"
b. 0.286"
c. 0.334"
d. 0.236"

187. A NPS 6 (6.625" od) seamless pipe made from ASTM A335 Grade P2 material operates at 800psi and 600 degrees F. The conditions require that a corrosion allowance of 0.125" be maintained. Calculate the minimum required thickness for these conditions.

a. 0.294"
b. 0.343"
c. 0.631"
d. 0.524"

188. A NPS 14 (14.00" od) seamless pipe made from ASTM A106 Grade A material operates at 300 psi and 600 degrees F. The pipe must cross a small ditch and it must be capable of supporting itself without a visible sag. A piping engineer states that the pipe must be at least 0.375" to support itself and the liquid product. He also states that a 0.125" corrosion allowance must be included. Calculate the minimum required thickness for the pipe.

a. 0.778"
b. 0.567"
c. 0.642"
d. 0.600"

189. A 10' long carbon steel pipe is welded to a 10' 18-8 stainless pipe and is heated uniformly to 475 degrees F. from 70 degrees F. Determine its total length after heating.

a. 20.067'
b. 20.156'
c. 20.234'
d. 20.095'

190. A blank is required between two NPS 10, 300 lb. class flanges. The maximum pressure in the system is 385 psi at 200 degrees F. A corrosion allowance of 0.175" is required. The inside diameter of the gasket surface is 9.25". The blank is ASTM A516 Grade 70 material with no weld joint. Calculate the pressure design thickness required for the blank.

a. 0.789"
b. 0.692"
c. 0.556"
d. 0.768"

191. A NPS 14 (14.00" od) seamless pipe made from ASTM A53 Grade B material operates at 600 psi 600 degrees F. Calculate the pressure design thickness for these conditions.

a. 0.243"
b. 0.442"
c. 0.205"
d. 0.191"

192. A NPS 6 piping system is installed in December 1989. The installed thickness is measured at 0.719". The minimum thickness of the pipe is 0.456" It is inspected December 1994 and the measured thickness is 0.608". An inspection in December 1995 reveals a 0.025" loss from the December 1994 inspection. During December 1996 the thickness was measured to be 0.571". What is the long term corrosion rate of this system?

a. 0.01996"/year
b. 0.02567"/year
c. 0.02114"/year
d. 0.03546" year

193. Using the data in question #192, calculate the short term corrosion rate.

a. 0.0051"/year
b. 0.0334"/year
c. 0.0234"/year
d. 0.012"/year

194. Using the information in questions #192 and #193, determine the remaining life of the system.

a. 18 years
b. 5.44 years
c. 1.2 years
d. 6 years

195. Using the information in question #194 and assuming an injection point in a Class 2 system with 7 years estimated until the next inspection what would the next interval be?

a. 10 years
b. 5 years
c. 3 years
d. 2.72 years

196. A seamless NPS 10 pipe, ASTM A106 Grade B material , operates at 750 psi and 700 degrees F. maximum. Considering only pressure design thickness, what minimum thickness is required?

a. 0.244"
b. 0.200"
c. 0.282"
d. 0.173"

197. A seamless NPS 16 pipe, ASTM A135 Grade A material operates at 550 psi and 600 degrees F. maximum. The thickness of the pipe as determined by the last inspection is 0.40". The pipe has been in service for 8 years. The original thickness at installation was measured to be 0.844" Two years previous to the 0.40" measurement the thickness of the pipe was found to be 0.54". Determine the greatest corrosion rate, i.e. short or long term.

a. 0.0550"/year
b. 0.0700"/year
c. 0.01324"/year
d. 0.02345"/year

198. A seamless NPS 12 pipe, ASTM A106 Grade B material operates at 750 psi and 700 degrees F. maximum. The thickness of the pipe as determined by the last inspection is 0.305". The pipe has been in service for 13 years. The original thickness at installation was measured to be 0.405" . Two years previous to the 0.305" measurement the thickness of the pipe found to be 0.316". The next planned inspection is scheduled for 8 years. Using the appropriate corrosion rate determine what MAWP the pipe will withstand at the end of the next inspection period.

a. 720 psi
b. 499 psi
c. 611 psi
d. 550 psi

199. A seamless NPS 6, ASTM A106 Grade A pipe operates at 300 degrees F. and 765 psi. The allowable stress is 16,000 psi. Using the Barlow equation, determine the required thickness for these conditions.

a. 0.446"
b. 0.332"
c. 0.231"
d. 0.158"

200. A seamless NPS 8, ASTM A106 Grade A pipe operates at 300 degrees F. and 741 psi. The allowable stress is 16,000 psi. The owner-user specified that the pipe must have 0.125" for corrosion allowance. Using the Barlow equation, determine the required thickness for these conditions.

a. 0.295"
b. 0.195"
c. 0.325"
d. 0.392"

201. A NPS 4 Schedule 80 (0.337" wall) branch connection is welded into a NPS 6 Schedule 40 (0.280" wall). A .375" reinforcing pad is used around the branch connection. The fillet weld sizes are as required by the Code.The branch connection is inserted into the header. The material of the branch and header is ASTM A672 Grade B70. What thickness would be used to determine whether heat treatment of the this connection is required? (Express answer to nearest hundreth)

a. 0.768"
b. 0.891"
c. 0.998"
d. 0.567"

202. An Inspector finds a thin area in the body of a NPS 8, 600 lb. gate valve body. The body is made from ASTM A216 WCB material The system operates at 900 psi and 750 degrees F. Using a corrosion allowance of 0.125", what minimum required thickness must the valve body have to continue to safely operate? (Round to the nearest 3 decimals)

a. 0.492"
b. 0.617"
c. 0.510"
d. 0.345"

API 570 PRACTICE QUESTIONS ANSWER KEY

1. c API 570, 1.1.1.1
2. b API 570, 1.1.1.2
3. a API 570, 1.1.1.3
4. b API 570, 1.1.2.1
5. b API 570, 1.1.2.1
6. b API 570, 1.4.4
7. b API 570, 2.1
8. a API 570, 2.2
9. d API 570, 3.1
10. d API 570 3.1
11. a API 570, 3.3
12. b API 570, 3.3.1
13. c API 570, 3.3.1
14. a API 570 3.3.1
15. b API 570 3.3.1
16. a API 570 3.3.1
17. c API 570 3.3.1
18. c API 570 3.3.2
19. c API 570 3.3.2
20. d API 570 3.3.2
21. c API 570 3.3.3
22. c API 570 3.3.3
23. d API 570 3.3.3.1
24. c API 570 3.3.3.2
25. b API 570, 3.3.4
26. d API 570, 3.3.4
27. b API 570 3.3.5
28. b API 570 3.3.6
29. a API 570 3.3.6
30. c API 570 3.3.7
31. d API 570 3.3.7
32. a API 570 3.3.
33. d API 570 3.3.8
34. a API 570 3.3.8
35. c API 570 3.3.9
36. b API 570 3.3.9
37. b API 570 3.3.9
38. a API 570 3.3.10
39. b API 570 3.3.10
40. b API 570 3.3.11
41. a API 570 3.3.12
42. d API 570 3.4.
43. c API 570 3.4.1
44. c API 570 3.4.1
45. b API 570 3.4.2
46. b API 570 3.4.2
47. a API 570 3.4.3
48. b API 570 3.4.3
49. a API 570 3.4.3
50. d API 570 3.4.5
51. b API 570, 3.5.1
52. b API 570, 3.5.2
53, c API 570, 3.5.2
54. c API 570, 3.5.2
55. c API 570, 3.5.2
56. b API 570, 3.5.3.1
57. a API 570, 3.5.3.1
58. b API 570, 3.5.3.2
59. c API 570, 3.5.3.3
60. c API 570, 3.5.3.4
61. b API 570, 3.6.
62. d API 570, 3.6.
63. a API 570, 3.6.
64. d API 570, 3.6.
65. a API 570, 3.7
66. a API 570, 3.7
67. c API 570, 3.7
68. d API 570, 3.7
69. d API 570, 3.7
70. b API 570, 3.7
71. c API 570, 3.7
72. d API 570, 3.7
73. c API 570, 3.7
74. a API 570, 3.8
75. d API 570, 3.9
76. c API 570, 3.10
77. b API 570, 3.10
78. d API 570, 3.10
79. b API 570, 3.11
80. c API 570, 3.11
81. c API 570, 3.11
82. b API 570, 4.2

82(1) a API 570 4.1

82(2) c API 570 4.1

82(3) a API 570 4.1

83. d API 570, 4.1.1
84. d API 570 4.1.2
85. b API 570, 4.2.3
86. b API 570 4.2
87. b API 570, 4.2
88. a API 570 4.4
89. a API 570, 4.3
90. c API 570, 4.3
91. d API 570, 4.4
92. c API 570 4.5.1
93. b API 570 4.5.2
94. a API 570 4.6.3
95. a API 570 5.1.1
96. a API 570 5.1.1
97. c API 570, 5.1.1
98. b API 570, 5.1.2
99. c API 570, 5.1.3
100. a API 570, 5.2
101. a ASME B31.3, PARA 304.1.2, API 570, 5.2
102. b API 570, 5.1 AND 5.2
103. b API 570, 5.1 AND 5.2
104. b API 570, 5.3
105. b API 570, 5.4
106. b API 570, 5.4
107. c API 570, 5.5
108. c API 570, 5.6

109. b API 570, 5.6
110. a API 570, 6.1
111. b API 570, 6.1.1
112. c API 570, 6.1.1
113. c API 570, 6.1.1
114. b API 570, 6.1.1
115. d API 570, 6.1.2
116. a API 570, 6.1.2
117. c API 570, 6.1.2
118. d API 570, 6.1.3.1
119. a API 570, 6.1.3.1
120. c API 570, 6.1.3.1
121. d API 570, 6.1.3.2
122. d API 570, 6.1.4
123. b API 570, 6.1.4
124. c API 570, 6.1.4
125. d API 570, 6.2
126. c API 570, 6.2
127. a API 570, 6.2.1
128. d API 570, 6.2.1
129. c API 570, 6.2.2.1
130. b API 570, 6.2.2.1
131. d API 570, 6.2.3
132. b API 570, 6.2.3
133. c API 570, 6.2.3
134. c API 570, 6.2.3
135. b API 570, 6.2.4
136. d API 570, 6.2.5
137. d API 570, 6.2.6
138. b API 570, 6.2.6
139. b API 570, 6.2.6
140. b API 570, 6.2.6
141. a API 570, 6.2.6
142. a API 570, 6.3
143. c API 570, SEC. 7-Inspection of Buried piping
144. b API 570, 7.1.1
145. c API 570, 7.1.2
146. b API 570, 7.1.3
147. a API 570, 7.1.5
148. a API 570, 7.1.6
149. b API 570, 7.2.1
150. c API 570, 7.2.2
151. b API 570, 7.2.3
152. c API 570, 7.2.4
153. a API 570, 7.2.5
154. c API 570, 7.2.6
155. d API 570, 7.2.6
156. d API 570, 7.2.6
157. b API 570, 7.2.7
158. b API 570, 7.2.7
159. d API 570, 7.2.7
160. d API 570, 7.2.7, Table 3
161. a API 570, 7.2.7
162. d API 570, 7.3.1
163. c API 570, 7.3.2 & 7.4
164. b API 570, APP. A, 1
165. d API 570, APP. A, 2
166. c API 570, APP. A, 4
167. c API 570, APP. A, 5
168. c API 570, APP. A, 6
169. b API 570, APP. A, 7
170. d API 570, APP. A, 8
171. d API 570, APP. A, 9
172. b API 570, APP. A, 10
173. b API 570, APP. A, 11
174. b API 570, APP. A, 12
175. a API 570, APP. A, 13
176. a API 570, APP. A, 14
177. c API 570, APP. A, 15
178. b API 570, APP. A, 43
179. c API 570, APP. A, 39
180. b API 570, APP. A, 45
181. a API 570, APP. D, D-1
182. a API 570, APP. D, D-1
183. b API 570, APP. D, D-1
184. c API 570, APP.D, D-2
185. b API 570, APP.D, D-2
186. d B31.3, 328.5.4(c)
187. a B31.3, 304.1.1
188. c B31.3, 304.1.1
189. a B31.3, Table C-1
190. b B31.3, 304.5.3
191. a B31.3, 304.1.1
192. c API 570, 5.1.1
193. d API 570, 5.1.1
194. b API 570, 5.1.1
195. d API 570, 4.3
196. a B31.3, 304.1.1
197. b API 570, 5.1.1
198. b API 570, 5.2
199. d B31.3, 304.1.1
200. c B31.3, 304.1.1
201. b B31.3, 331.1
202. b API 574, 9.2