API 653 CLOSED BOOK PREPARATORY QUESTIONS

Note: try these questions after read API 653 once; some of following questions will be as open book. These questions are prepared to under stand each and every section of the API 653

1. The rules given in API 653 standards are _____ requirements. This standard is not to be interpreted as approving, recommending, or endorsing and specific design or limiting the method of inspection, repair, alteration, or reconstruction.

a. maximum
b. to fulfill owner/operator requirements.
c. Minimum
d. Optional

2. API 653 covers…….

a. carbon and low alloy steel tanks built to API 650 and its predecessor API 12C.
b. carbon and low alloy steel tanks built to API 650 only
c. All carbon and low alloy steel tanks with construction code.
d. Owner/operator requirements.

3. API 653 scope is limited to the following but not one of this?

a. tank foundation.
b. First threaded joint
c. Roof
d. Attached appurtenances.
e. None of the above.

4. In the case of apparent conflicts between requirements of API 653 and API 650, for which tank place in service. Consideration to?

a. Owner/operator can decide to take up with one of the code requirement.
b. API 653
c. API 650
d. Construction code.

5. The provision of API653 who has ultimate responsibility.

a. API 653 committee members.
b. API 653 Inspector
c. Manufacture of tank.
d. Owner/operator.

6. Any provision of API 653 standard presents a direct or implied conflict with any statutory regulation, then……

a. API 653 will govern.
b. Regulation will govern,
c. API 650 will govern,
d. Construction code will govern.
e. Owner/operator is have responsibility for this.

7. Before doing internal inspection, procedure shall be developed according to the guidelines given in ……

a. API 2015, recommended practice 2016.
b. API 653 an API 650
c. Owner/operator procedure.
d. API 653 Inspector procedure.

8. Example of an alteration is…….

a. Decrease in tank shell height.
b. 24” nozzle replacement.
c. All of the above.
d. None of the above.

9. The correct definition for applicable standard is……

a. The original standard of construction.
b. Current edition of appropriate standard when original standard of construction has been supersede.
c. Such as API standard or specification or under writes laboratories standard.
d. All of the above.

10. The pressure used to describe tanks designed to withstand as internal pressure up to but not exceeding 2 ½ lbf/sq. in gauge is……

a. Operating pressure.
b. Design pressure.
c. Atmospheric pressure
d. Maximum allowable pressure

11. Authorized inspection agency is……

a. Inspection organization of the jurisdiction.
b. Inspection organization of the insurance company.
c. Owner/operator who maintaining inspection organization.
d. An independent organization or individual under contract with owner/operator.
e. All of the above.

12. Break over point is related to…….

a. Settlement.
b. Life of tank.
c. Operation of valves.
d. Design of tanks.

13. Corrosion rate is the total metal loss divided by the…….

a. Period of time over which the metal loss occurred.
b. Twice the period of time over which the metal loss occurred.
c. Period in years over which the metal loss occurred.
d. All the above.

14. The portion of the tank bottom or annular plate with in 3" of the inside edge of the shell, measured radially inward is……

a. Critical area.
b. Special attention area.
c. Alarm area.
d. Critical Zone.

15. The following are example of repair in tank and not this one?

a. Removal of reinforcing plate.
b. Repair of tears or gouges by grinding.
c. Re-leveling and/or jacking of tank.
d. None of the above.

16. Repair organization is an organization that……..

a. An owner/operator of storage tank who repair or alters his/her own equipments in accordance with API 653.
b. A contractor whose qualifications are acceptable to the owner/operator.
c. One who is authorized by, acceptable to or otherwise not prohibited by jurisdiction.
d. All of the above.

17. Roof plate corroded to an average thickness of less than _____ in any 100 sq.in. area or roof plate with any _____ through the roof plate shall be required or replaced.

a. 0.10in ; holes.
b. 0.09in ; dents.
c. 0.10in ; dents.
d. 0.09in ; holes.

18. When tank roof evaluation, the structural _____ of the roof and roof support system shall be verified.

a. Corrosion rate.
b. Supports.
c. Integrity.
d. Design needs.

19. When fixed roof tank evaluation, particular attention must be given to the possibility of severe internal corrosion of pipe columns. But……..

a. Corrosion easily can see by external visual inspection.
b. Corrosion may not be evident by external visual inspection.
c. Particular attention not required, because of fixed roof.
d. Corrosion will not be severe in pipe columns.

20. Roof support system, perimeter seal system, appurtenances such as a roof rolling ladder should inspected when evaluation of …….

a. Any roofs.
b. Fixed roofs only.
c. Floating roof only.
d. Any roofs if owner/operator requires.

21. Guidance for evaluation of existing floating roofs shall be based on the criteria of API653 standard is……

a. Mandatory.
b. Not mandatory.
c. Mandatory if owner/operator requires.
d. Not covering by this standard.

22. When change of service in external pressure the roof to shell junction shall be valuated for the effects of a design partial vacuum. The criteria outlined in _____ shall be used.

a. API653
b. API620
c. API650
d. Construction code or applicable standard.

23. When change of service in internal pressure all requirements of the _____ shall be considered in the evaluation and subsequent modification of the tank roof to shell junction.

a. API653
b. API620
c. API650
d. Construction code or applicable standard.

24. When change of service; Operation at elevated temperature all requirements of _____ shall be considered before change the service of a tank to operation at temperature above 200°F.

a. API653
b. API620
c. API650
d. Construction code or applicable standard.

25. Riveted tank, which is in service can inspected by API 653?

a. Yes
b. No
c. No because API 650 not allowed riveted tanks.
d. Yes because API 650 for welded and riveted tanks.

26. When determining actual thickness, the maximum vertical length in inch (L) calculated by formula $L=3.7\sqrt{Dt2}$. where L is……..

a. Not more than 40in.
b. Minimum 40in.
c. It depends on tank diameter and thickness.
d. This formula is wrong.

27. When determining actual thickness; the maximum vertical length in inch over which hoop stress are assumed to _____ around local discontinuities.

a. Average
b. Average out
c. Minimum
d. Maximum

28. When determining actual thickness; the actual corroded area may _____ to the maximum vertical length (L).

a. Lesser
b. Exceed
c. Same
d. Average

29. When determining actual thickness; the least thickness in inch (t2), in an area of corrosion _____ of pits.

a. At the point.
b. Exclusive.
c. Inclusive
d. Any area.

30. When determining the lowest average thickness (t1), averaged over a length of L, using at least _____ equal spaced measurements over length L.

a. 6
b. 5
c. Each 6-inch.
d. Each 5-inch.

31. Determination of minimum thickness in the corroded area excluding widely scattered pits is…….

a. Al
b. Dimension Inspector
c. NDT operator (UT/RT)
d. Owner/operator

32. Widely scattered pits may be ignored…….

a. Can't ignored and it should be inspected.
b. If pit depth less than ½ of minimum acceptable thickness.
c. Above statement (b) with exclusive of the corrosion allowance.
d. None of the above.

33. When calculating minimum thickness, the joint efficiency is _____ for evaluating the retirement thickness in a corroded plate.

a. 0.7
b. As per table 4.2 API 653.
c. 1.0
d. None of the above.

34. Expand MFL.

a. Magnetic florescent leak detector.
b. Magnetic flux leakage.
c. Monitoring flux leakage.
d. None of the above.

35. For bottom plate thickness measurements MFL and UT are used but…….....

a. UT is often used to confirm and further quantify data obtained by MFL.
b. UT will be always preferred for bottom plate.
c. After UT measurements taken inspector should confirm with MFL method.
d. None of the above.

36. Unless stress analysis is performed, the minimum bottom plate thickness is the critical zone of the tank bottom shall be the smaller of ½ of the original bottom plate thickness or 50% of 't' min. of the lower shell course but not less than_____

a. 1in.
b. 0.5in.
c. 0.25in.
d. 0.1in.

37. The thickness of the projection of the beyond the shell as measured at the toe of the outside bottom to shell weld shall not less than _____.

a. 0.01in.
b. 0.05in.
c. 0.25in.
d. 0.1in.
e. 0.5in.

38. The projection of the bottom plate beyond the outside toe of the shell-to-bottom weld shell shall be at least_____.

a. ¼ in.
b. ½ in.
c. 3/8 in.
d. 5/8 in.

39. Isolated pitting _____ appreciably affect the strength of the bottom plate & annular plate.

a. Will
b. Will not
c. May
d. May not

40. Due to strength requirements, the minimum thickness of annular plate ring usually greater than _____.

a. 0.5 in.
b. 0.25 in.
c. 0.1 in.
d. 0.275 in.

41. Calcining _____.

a. Can occur when concrete has been exposed to sufficient high temperature.
b. Can occur when tank has been exposed to sufficient high temperature.
c. Can occur when tank roof exposed to with calcium product in tank.
d. None of the above.

42. Temperature cracks do not seriously affect the strength of the_____ structure.

a. Roof.
b. Tank supports.
c. Shell.
d. Concrete foundation.
e. None of the above.

43. The following all are tank failure due to brittle fracture but not this one_____.

a. Tank continuously served in low temperature service.
b. After erection during hydrostatic testing.
c. First filling in cold weather.
d. After a change to lower temperature service.
e. None of the above.

44. A tank has demonstrated the ability to with stand the combined effects of maximum liquid level and lower operating temperature without failing. For the above tank, whether the risk of failure due to brittle fracture with continued service in minimal?

a. No, brittle fracture will depend on low temperature of product.
b. No, brittle fracture is not dangerous in tank by experience.
c. Yes it is minimal.
d. None of the above.

45. If a tank shell thickness is no greater than _____ the risk of failure due to brittle facture is minimal.

a. ½ in.
b. ¼ in.
c. ¾ in.
d. 1/8 in.

46. By the experience brittle fracture will not occurred at shell metal temperature above _____.

a. Ambient.
b. 60°F.
c. 100°F
d. 0°F.

47. To avoid brittle fracture some tanks have heaters this heaters will increase the metal temperature by heating the _____.

a. Shell plate.
b. Bottom plate.
c. Tank contents.
d. Fire water line.

48. Tanks fabricated from steels of unknown toughness thicker than _____ operating at a shell metal temperature below _____ can be used if the tank meets the requirements of brittle fracture consideration.

a. 1 in ; Ambient
b. 1 in ; 60°F.
c. ½ in ; 60°F.
d. ½ in ; Ambient

49. The interval between inspections of tank should be determined by its service _____ unless special reasons indicate that an earlier inspection must be made.

a. History
b. Life
c. Severity
d. All of the above

50. In some cases _____ also control the frequency and interval of the inspection.

a. National board regulations.
b. Jurisdictional regulations.
c. Owner/operator regulations.
d. Authorized inspector.

51. Routine In-service inspections can be done by

a. Owner/operator personnel.
b. Authorized inspector.
c. Who has knowledge about the tank and its operation.
d. All of the above.

52. The interval of routine in-service inspections shall be consistent with conditions at the particular site, but shall not exceed _____.

a. 5 years.
b. Six months.
c. One month.
d. One year.

53. Routine in-service inspection shall include the following and not this one?

a. Thickness check.
b. Visual inspection.
c. Evidence of leak.
d. Shell distortions.
e. Corrosion.

54. External inspection for all tanks shall be given a visual external inspection by authorized inspector. For this inspection maximum interval will be _____.

a. 5 years.
b. 5 years or RCA/2N years, which ever is less.
c. 5 years or RCA/4N years, which ever is less.
d. 5 years if corrosion allowance known, 15 years if corrosion allowance not known.

55. External inspection for all tanks shall be done by Al. And during this inspection that tank _____.

a. Shall be in operation during this inspection.
b. May be in operation during this inspection.
c. Should be in operation during this inspection.
d. None of the above.

56. You are the inspector for tank to do external inspection. And tank was insulated by 150mm outside insulation and covered by aluminum sheets. What will be your action?

a. Remove small area for inspection and cover it properly after inspection.
b. Removal of insulation is not at all required for external inspection.
c. Insulation removal only for necessary area to check the external wall.
d. It is always authorized inspector's option to open insulation.

57. The extent of ultrasonic thickness measurement inspection shall be determined by ……

a. Authorized inspector.
b. UT operator.
c. Owner/operator.
d. Tank design engineer.

58. When the corrosion rate is known what will be the maximum interval of ultrasonic thickness inspection?

a. 5 years.
b. 15 years.
c. RCA/4N.
d. Both 'a' and 'c' which ever is smaller.
e. None of the above.

59. Whether external inspection can be substituted for a internal inspection?. If yes what is the maximum interval.

a. No.
b. Yes.
c. Yes, if external inspection interval is equal to or less than interval required for internal inspection.
d. None of the above.

60. You have calculated external inspection interval as 2 years, then what will be the ultrasonic thickness inspection interval?

a. 1 year.
b. 2 years.
c. 4 years.
d. None of the above.
e. Not enough data to calculate ultrasonic thickness inspection interval.

For question number 61 to 65 the following data are to be used.

Tank No.	**: ABC 650**
Thickness of tank shell plate when installed	**: 0.505 inch.**
Thickness of tank shell plate required by design	**: 0.255 inch.**
Ultrasonic Thickness at present is	**: 0.375 inch.**
Installed on	**: June 1993**

61. What is the maximum routine in-service inspection interval for the tank ABC 650?

a. 3 years.
b. 11/2 year.
c. 1 month.
d. 5 years.

62. External inspection interval for tank ABC 650 is?

a. 6 years.
b. 1½ year.
c. 3 years.
d. 5 years.
e. 15 years.

63. Ultrasonic inspection interval for tank ABC 650 is?

a. 6 years.
b. 1½ year.
c. 3 years.
d. 5 years.
e. 15 years.

64. Ultrasonic inspection interval for tank ABC 650 if corrosion allowance not known will be?

a. 6 years.
b. 1½ year.
c. 3 years.
d. 5 years.
e. 15 years.

65. For the tank ABC 650 the next internal inspection data will be around June 2008, and the last external inspection were did in June 2006. What will be the next external inspection data?

a. June 2006
b. Jan 2008
c. June 2012
d. No need of next one external inspection.
e. None of the above.

66. Internal inspection carryout when tank _____.

a. In shutdown only, because inspector has to do visual inside.
b. In-service only.
c. In-service also can do, if some alternative of inspection to get the requirements of internal inspection programme.
d. None of the above.

67. The maximum intervals of internal inspection shall not exceed in any case more than _____.

a. 10 years.
b. 20 years.
c. 5 years.
d. Depends on corrosion rate.

68. RBI analysis should be reviewed at least once in _____.

a. 10 years.
b. 20 years.
c. 5 years.
d. Depends on corrosion rate.

69. Internal inspection interval normally controlled by ……..

a. Bottom corrosion.
b. Bottom and shell corrosion
c. Bottom, shell and roof corrosion.
d. By RBI
e. None of the above.

70. When corrosion rates are not known and similar service experience is not available to estimate bottom plate minimum thickness at the next inspection, the inspection interval shall not exceed_____.

a. 10 years.
b. 20 years.
c. 5 years.
d. Owner/operator should decide.
e. Authorized inspector should decide.

71. If external inspection can access to all the area of tank, then the internal inspection can be eliminated.

a. Yes.
b. No, internal inspection never eliminated by external inspection.

c. Depends on owner-operator requirements.
d. None of the above.

72. All new material used for repair, alteration, or reconstruction shall confirm to ___

a. Current applicable tank standards.
b. Applicable tank standard.
c. Construction code.
d. API 653
e. API 650

73. All _____ materials shall be identified.

a. Shell, bottom and roof plates.
b. Shell and bottom plates.
c. Shell and bottom plates welded to the shell.
d. All the above.

74. Material not identified shall be tested accordance with _____

a. ASTM A20 and A6
b. API 650
c. ASTM A6 and A370
d. API 653 App. D

75. When material not identified shall be tested, for this test specimen selection by _____.

a. One per heat.
b. One per lot
c. One per tank
d. Each plate.

76. How many tension specimen required when direction of rolling not known during mechanical test to identify materials which is used for reconstruction?

a. 4
b. 1
c. 2
d. 2 for less than or equal to 1” and 4 for above 1”.

77. For tank all new shell joints shall be _____ with complete penetration and complete fusion.

a. Lap weld.
b. Full weld.
c. Butt weld.
d. Groove weld.

78. When tank is planned to reconstruction, thickness to be used each shell course when checking tank design shall be based on measurement taken_____.

a. With in 180 days prior to relocation.
b. Current thickness prior to relocation.
c. After relocation new thickness readings shall be taken.
d. Last ultrasonic thickness measurement can use.
e. None of the above.

79. For reconstruction tank, when calculating the maximum liquid level, if the actual thickness is greater than that necessary to allow the liquid level required, the extra thickness can be considered _____.

a. For calculating maximum liquid level.
b. As corrosion allowance.
c. Excess thickness.
d. As a wrong selection of thickness.

80. All repair work must be authorized by _____ before commencement of the work by a repair organization.

a. Authorized inspector.
b. Engineer experienced in storage tank design.
c. 'a' or 'b'
d. The owner/operator.

81. The Authorized inspector may give prior general authorization for limited or routine repair as long as authorized inspector is _____.

a. After consulting with an engineer experienced in storage tank design.
b. Sure that repair will not require hydrostatic testing or don't require an engineering evaluation.
c. If the repair as per API 650.
d. 'a' and 'b'.

82. The minimum dimension for a replacement shell plate is?

a. 10 inch or 10 times thickness of the replacement plate which ever is greater.
b. 12 inch or 12 times thickness of the replacement plate which ever is less.
c. Minimum size depends on the area repaired and that tank diameter.
d. None of the above.

83. The replacement plate may of shape?

a. Circular, oblong.
b. Square or rectangular with round corners.
c. Square or rectangular when full shell plate replaced.
d. All of the above.
e. ‘a’ and ‘b’.

84. In a tank shell plate replacement is on going prior to welding the new vertical joints, the existing horizontal welds shall be cut for a minimum distance of _____ beyond the new vertical joints.

a. 12 inch or 12 times the thickness of plate which ever is greater.
b. 10 inch.
c. 12 inch.
d. Full horizontal has to cut before welding vertical.

85. In question number 84. which joint has to weld first?

a. Horizontal has to weld prior to vertical.
b. Vertical.
c. Both horizontal and vertical simultaneously.
d. It is the option of repair organization.

86. For replacement tank plates, all weld intersection _____.

a. Shall be at approximately 90°.
b. May be at approximately 90°.
c. Should be parallel.
d. May not be at 90°.

87. Lapped patch shell repair shall not be used on any shell course thickness that exceeds _____ or to replace door sheets or shell plates.

a. ¼
b. ½
c. ¾
d. 1

88. Lapped patch shell repair plates corners shall be rounded to a minimum radius of _____ except shell to bottom joints.

a. 6 inch.
b. 3 inch.
c. 2 inch.
d. 12 inch.

89. Shell opening and their reinforcements _____ be positioned with in a lapped patch shell repair.

a. May not.
b. Shall not.
c. Should not.
d. Depends on owner/operator option.

90. Weld reinforcement in excess are with in the limit to API 650 for a exiting weld of a tank. If change of service this weld reinforcement……

a. It is acceptable to API 650, so nothing to do.
b. Smooth grinding required.
c. For a floating roof with flexible seals service it may required to grinding.
d. Floating roof with flexible seals has to design according to the existing weld reinforcements.

91. If the shell plate greater than ½ inch. All penetration shall be installed with the use of an insert plate if the penetration diameter _____.

a. 2 inch and above.
b. Above 2 inch.
c. Less than 2 inch.
d. Insert plate is not required for nozzles.

92. The minimum diameter the insert plate shall be at least _____diameter (d) of the penetration.

a. 2d
b. d+12 inch.
c. Greater of 2d or d+12 inch,
d. Same as insert plate diameter.

93. The minimum dimension for a weld on patch that over laps a bottom seam or existing patch is _____. When the thickness of existing plate is ½ inch.

a. 12 inch.
b. 6 inch.
c. 3 inch.
d. 24 inch.

94. Welded-on patch plate over the areas of the tank bottom that have global dishing, local dishing, settlement or over distortion are _____.

a. Shall be profiled to that shape.
b. Shall not be used.
c. Split patches can be used.
d. None of the above.

95. The addition of welded-on-patch may not advisable if the tank is still_____.

a. Distortion.
b. Undergoing settlement.
c. Global or local dishing.
d. All of the above,

96. All the corner of the bottom welded-on-patch plate shall be rounded of to _____ minimum radius except tombstone shaped shell side.

a. 6 inch.
b. 12 inch.
c. 2 inch.
d. Greater of 6t or 12 inch.

97. Welded-on-patch plates are not permitted in the critical zone on a tank bottom with an operation temperature of?

a. 0°F for carbon steel and -32°F for stainless steel.
b. 200°F for carbon steel and 100°F for stainless steel.
c. Any lower temperature then the MDMT.
d. Any lower temperature then one-day mean minimum temperature.

98. The minimum thickness of new roof plate shall be _____without any corrosion allowance.

a. 0.1 inch.
b. 1/8 inch.
c. 3/16 inch.
d. ¼ inch.

99. All leaking in pontoons or compartments of double deck floating roofs shall be repaired by re-welding the leaking its and/or of _____

a. New pontoons.
b. Patch plates.
c. Insert plates.
d. All the above.

100. In primary seals of floating roof, to minimize evaporation losses and reduce potential hazard to the worker, no more than _____ of the roof seal systems should not be out of in service tank at one time

a. Half.
b. One fourth.
c. 10%.
d. 50%.

101. In tank during hot tapping operation, tank liquid shall be_____.

a. At least 3 feet above hot tap location.
b. Removed fully from tank.
c. No need to remove, but must be arrested all valves to the hot tap location to ensure no contact with hot tap nozzle.
d. None of the above.

102. Before hot tapping shell plate thickness measurement shall be taken at a minimum of _____ place along the circumference of the proposed nozzle location.

a. At least one.
b. 4
c. 6
d. At least two.

103. At hot tapping required reinforcement plate this plate has two half, after reinforcement plate has been welded to the shell and NDT carried out, the pad shall be pneumatically tested. For this pneumatic test how many telltale hole required.

a. One
b. Each half one.
c. Any where to convenient to NDT person.
d. None of the above.

104. Who shall approve all reconstruction work at the designated hold points and after reconstruction has been completed in accordance with the requirement of API653.

a. Authorized inspector.
b. An engineer experienced in storage tank design.
c. ‘a’ or ‘b’.
d. Any one designated by owner/operator.

105. A tank has decided to dismantle and reconstruct in new site, during dismantling roof, shell, bottom plates are to be cut by reconstruction organization. They are cutting in to pieces, the size of cutting for their convenient to _____.

a. Erect properly.
b. Transportable.
c. Drawing size.
d. They have to follow drawing for cutting.

106. During reconstruction welding the thickness over 1 inch and with in 3 inch of base metal shall be heated the place where welding to be started to what temperature before welding?

a. 200°F.
b. Warm to hand.
c. 100°F.
d. 50°C.

107. What will be the maximum allowance undercut for horizontal joints, when a tank reconstruction?

a. 1/64 inch.
b. 1/16 inch.
c. 1/32 inch.
d. 1/8 inch.

108. During reconstruction f shells tack welding used for fit-up in position before welding this tack_____.

a. Shall be removed before welded manually.
b. Cleaned and need not removed for SAW if they are fused.
c. Tack weld shall be made with qualified procedure and welder.
d. All of the above.

109. For reconstruction tank, the maximum out of plumpness of the top of the shell relative to the bottom of the shell shall not exceed _____ to the total tank height with a maximum of 5 inch.

a. 1/200
b. 1/100
c. 1/250
d. 1/50

110. If the material specification for the steel from an existing tank is unknown or obsolete, test coupons for the welding procedure qualification shall be _____.

a. Similar material to be used.
b. Comply with API 653 and API 650.
c. Cut a piece from tank.
d. Existing procedure can be used.

111. What NDT shall be done for completed welds attaching nozzle neck to shell and reinforcing plate to shell and to nozzle neck?

a. MT or PT.
b. Visual.
c. FMT and/or UT.
d. ‘a’ or ‘c’.

112. NDT shall be conducted after stress relief and, if hydrostatic testing has to follow after stress relief, NDT must be done _____ hydrostatic testing.

a. After
b. Before
c. After all activities
d. Before stress relief.

113. New welds attaching existing shell plate to existing or new shell plate shall be examined by _____.

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

114. New welding on the shell to bottom joint first weld pass shall be inspected by applying _____ to the side opposite the first weld pass made. The oil shall be allowed to stand at least 4 hours and then the weld inspected for wicking action.

a. Light diesel oil.
b. Vegetable oil.
c. Inspection oil.
d. Light viscosity oil.
e. Any of the above.

115. After completion of shell to bottom inside and outside fillet or partial penetration welds, the welds shall be tested by pressurizing the volume between the inside and outside welds with air pressure to _____ and applying a solution film to both welds.

a. 25 psig.
b. 15 psig.
c. 50 psig.
d. 65 psig.

CLOSED BOOK QUESTIONS FOR API 653
ANSWERS

1.	C	1.1.1	API653
2.	A	1.1.1	API653
3.	E	1.1.1.	API653
4.	B	1.1.2	API653
5.	D	1.2	API653
6.	B	1.3	API653
7.	A	1.4	API653
8.	B	3.1	API653
9.	D	3.2	API653
10.	C	3.3	API653
11.	E	3.4	API653
12.	A	3.6	API653
13.	A	3.8	API653
14.	D	3.9	API653
15.	A	3.15	API653
16.	D	3.16	API653
17.	D	4.2.1.2	API653
18.	C	4.2.1.1	API653
19.	B	4.2.2	API653
20.	C	4.2.3.3	API653
21.	B	4.2.3.4	API653
22.	B	4.2.4.2	API653
23.	D	4.2.4.1	API653
24.	C	4.2.4.3	API653
25.	A		API653
26.	A	4.3.2.1b	API653
27.	B	4.3.2.1 b	API653
28.	B	4.3.2.lb	API653
29.	B	4.3.2.1b	API653
30.	B	4.3.2.1	API653
31.	A	4.3.2.la	API653
32.	C	4.3.2.2	API653
33.	C	4.3.3.1	API653
34.	B	4.4.6	API653
35.	A	4.4.6	API653
36.	D	4.4.7.4	API653
37.	D	4.4.7.7	API653
38.	C	4.4.7.7	API653
39.	B	4.4.7.4&4.4.8.1	API653
40.	C	4.4.8.1	API653

41.	A	4.5.1.2b	API653
42.	D	4.5.1.2e	API653
43.	A	5.2.1	API653
44.	C	5.2.1	API653
45.	A	5.3.4	API653
46.	B	5.3.5	API653
47.	C	5.3.5	API653
48.	C	5.3.7	API653
49.	A	6.2.2	API653
50.	B	6.2.3	API653
51.	D	6.3.1.1	API653
52.	C	6.3.1.2	API653
53.	A	6.3.1.3	API653
54.	C	6.3.2	API653
55.	B	6.3.2.1	API653
56.	C	6.3.2.2	API653
57.	C	6.3.3.1	API653
58.	B	6.3.3.2b	API653
59.	A	6.3.3.2	API653
60.	C	6.3.3.2	API653
61.	C	6.3.1.2	API653
62.	C	6.3.2.1	API653
63.	A	6.3.3.2	API653
64.	D	6.3.3.2	API653
65.	D	6.3.3.3	API653
66.	C	6.4.2. I	API653
67.	B	6.4.2. I	API653
68.	A	6.4.3	API653
69.	A	6.4.2.1	API653
70.	A	6.4.2.2.	API653
71.	A	6.5	API653
72.	A	7.2	API653
73.	C	7.3.1. I	API653
74.	C	7.3.1.2	API653
75 .	D	7.1.3.2	API653
76.	C	7.3.1.2	API653
77.	C	8.2.2	API653
78.	A	8.4.1	API653
79.	B	8.4.4.	API653
80.	C	9.1.3	API653

81.	B	9.1.3	API653
82.	D	9.2.2.1	API653
83.	D	9.2.2.1	API653
84.	C	9.2.2.2	API653
85.	B	9.2.2.2	API653
86.	A	FIG9. I note 1	API653
87.	B	9.3.1.2	API653
88.	C	9.3.1.4	API653
89.	B	9.3.1.8	API653
90.	C	9.6.2	API653
91.	B	9.8.2	API653
92.	C	9.8.2	API653
93.	A	9.10.1.1a	API653
94.	B	9.10.1.1c	API653
95.	B	9.10.1.1c	API653
96.	C	FIG 9.5	API653
97.	B	9.10.1.2.3	API653
98.	C	9.11.1.1	API653
99.	B	9.12.3	API653
100.	B	9.13.1	API653
101.	A	9.14.1.2	API653
102.	B	9.14.3.2	API653
103.	B	FIG 9.6	API653
104.	C	10.1.4	API653
105.	B	10.3.1	API653
106.	B	10.4.2.3	API653
107.	C	10.4.2.5	API653
108.	D	10.4.2.7	API653
109.	B	10.5.2	API653
110.	C	11. 1.2	API653
111.	C	12.1.2.3	API653
112.	B	12.1.2.4	API653
113.	B	12.1.5.1	API653
114.	A	12.1.6.1	API653
115.	B	12.1.6.2	API653