PRACTICE EXAM 19: STEAMFITTER / PIPEFITTER RED SEAL SIMULATION (130 QUESTIONS)

This practice exam contains 130 four-option multiple-choice questions. Allow up to four hours, work from the conditions stated in each stem, and review every explanation after scoring. The published passing standard is 70 percent; confirm current administration details with the official Red Seal information before sitting the examination.

1. At the pharmaceutical utility project, during troubleshooting, with a late field change, A portable grinder vibrates after a wheel change. What should the worker do?

A. Press harder to stabilize the tool
B. Stop, isolate the tool, and inspect the wheel and installation
C. Continue until the wheel wears smooth
D. Remove the guard to improve balance

2. At the pharmaceutical utility project, during maintenance, with a night-shift handover, A chemical label is missing from a small transfer container. Which action is correct?

A. Identify it by smell and colour
B. Pour it into a larger labelled container
C. Ask another worker to guess the contents
D. Do not use it until the contents are positively identified and labelled

3. At the pharmaceutical utility project, during turnover, with a temporary support arrangement, A permit requires a gas test before work starts. When should the result be accepted?

A. When the area has been ventilated for five minutes
B. When a worker says the air feels normal

C. When the permit is signed without measurements
D. When the authorized tester confirms the required conditions and records them

4. At the pharmaceutical utility project, during shutdown, with a wet-weather condition, A worker reports numbness after prolonged use of a vibrating tool. What is the best response?

A. Grip the tool tighter to improve control
B. Continue until the task is finished
C. Stop, report the condition, and review the task and exposure controls
D. Switch hands without changing the exposure

5. At the pharmaceutical utility project, during pre-job planning, with a restricted access route, A drain is opened and the discharge is hotter and faster than expected. What should happen?

A. Place a hand near the stream to judge temperature
B. Move clear, control the release, and reassess the isolation and energy state
C. Tighten the valve while standing in front of it
D. Continue removing the next component

6. At the pharmaceutical utility project, during material receiving, with a replacement component, A new worker is assigned to a lift area. Which briefing is most important?

A. Review the load path, exclusion zone, signals, and stop command
B. Tell the worker to watch the hook only
C. Ask the worker to stand wherever space is available
D. Give the worker a copy of the drawing without explanation

7. At the pharmaceutical utility project, during layout, with a first-time crew member, Before work begins, the crew must establish an energy-control boundary. Which action is most important first?

A. Identify every energy source and the approved isolation method

B. Begin dismantling at the nearest joint
C. Ask the operator whether the line feels inactive
D. Place warning tape after the component is opened

8. At the pharmaceutical utility project, a layout note calls for a 3.5-inch offset. What is the length in millimetres?

A. 35
B. 88.9
C. 8.89
D. 889

9. At the pharmaceutical utility project, during fit-up, with a scheduled outage, A container of unfamiliar thread sealant is found at the workface. What should the worker do?

A. Use it if the colour matches the usual product
B. Mix it with the old sealant to improve coverage
C. Read the current safety data sheet and confirm compatibility
D. Apply it first and check the label after testing

10. At the pharmaceutical utility project, during installation, with a revised work package, A hot-work task is planned near insulated piping. Which control is most defensible?

A. Start quickly before nearby crews return
B. Wet the insulation and proceed without a permit
C. Rely on the welding hood to control surrounding hazards
D. Confirm authorization, remove or protect combustibles, and provide fire watch

11. At the pharmaceutical utility project, during pressure testing, with a crowded mechanical room, A worker is asked to enter a vessel to retrieve a tool. What is the correct response?

A. Stop and follow the confined-space entry and rescue procedure
B. Enter briefly because the tool is visible
C. Send the smallest worker through the opening
D. Use a fan without completing the entry assessment

12. At the pharmaceutical utility project, during start-up, with a newly isolated line, A work area has cutoffs, wire, and oily rags around a walking route. What is the best action?

A. Step over it until the installation is complete
B. Remove the debris and restore a clear, controlled work area
C. Move it beside the nearest emergency exit
D. Cover it with cardboard to prevent trips

13. At the pharmaceutical utility project, during troubleshooting, with a late field change, A pressure gauge has a damaged lens and an unreadable zero. How should it be treated?

A. Tap it until the pointer returns to zero
B. Use it only for low-pressure work
C. Remove it from service and obtain a suitable verified instrument
D. Read it from the side to avoid the damaged lens

14. At the pharmaceutical utility project, during maintenance, with a night-shift handover, During a shift change, the incoming crew receives different line information. What should happen?

A. Use the newer worker's memory as the deciding source
B. Pause the handover and reconcile the information before work continues
C. Continue while both crews compare notes later
D. Choose the line that is easiest to access

15. At the pharmaceutical utility project, during turnover, with a temporary support arrangement, A spool must be moved manually through a narrow opening. Which approach is safest?

A. Pull harder while one worker guides by hand
B. Lift from the nearest flange without checking balance
C. Roll it across the floor and stop it with a foot
D. Plan the route, use suitable handling aids, and control pinch points

16. At the pharmaceutical utility project, during shutdown, with a wet-weather condition, A small solvent spill occurs in the work area. What is the appropriate first response?

A. Wash it into the nearest floor drain
B. Cover it with insulation scraps
C. Stop the source if safe, control ignition, and follow the spill procedure
D. Ignore it if the vapour is not immediately visible

17. At the pharmaceutical utility project, during pre-job planning, with a restricted access route, A cut piece has lost its material identification. What should happen before installation?

A. Use it if the outside diameter matches
B. Install it in a low-pressure branch
C. Compare its weight with a known piece
D. Segregate it and restore traceability through the approved process

18. At the pharmaceutical utility project, during material receiving, with a replacement component, During fit-up, a spool aligns only when the pipe is forced sideways. What is correct?

A. Stop and correct the route, dimensions, or support arrangement
B. Tighten the bolts to pull the faces together
C. Heat the flange until the misalignment disappears
D. Leave the temporary force in place after testing

19. At the pharmaceutical utility project, during layout, with a first-time crew member, A flange pair has uneven gaps before bolting. What should be checked first?

A. Alignment, face condition, gasket fit, and support before tightening
B. Increase bolt torque on the widest gap
C. Add a second gasket to fill the space
D. Use the bolts to draw the piping into position

20. At the pharmaceutical utility project, during fabrication, with an unexpected instrument reading, A long straight run is anchored at both ends without a movement review. What concern is raised?

A. The pipe will always become self-supporting
B. Thermal movement may create excessive stress or load connected equipment
C. The anchors will eliminate all pressure drop
D. The line will automatically drain toward the centre

21. At the pharmaceutical utility project, during fit-up, with a scheduled outage, A pipe passes through a rated wall. What installation detail is essential?

A. Pack the opening tightly with ordinary insulation
B. Weld the pipe directly to the wall sleeve
C. Provide the specified sleeve, clearance, and firestopping arrangement
D. Leave the opening open for future movement

22. At the pharmaceutical utility project, during installation, with a revised work package, A pressure test includes a sensitive instrument that is not rated for the test pressure. What should happen?

A. Install a larger gauge beside it
B. Proceed because the instrument is downstream
C. Cover the instrument with a rag during testing
D. Isolate or remove the instrument using the approved method

23. At the pharmaceutical utility project, during pressure testing, with a crowded mechanical room, A valve's flow arrow conflicts with the intended service direction. What should be done?

A. Reverse the line flow during operation
B. Remove the arrow label
C. Install the valve and rely on the handle position
D. Stop and verify the valve selection and orientation before testing

24. At the pharmaceutical utility project, during start-up, with a newly isolated line, A grooved coupling is being installed on a pipe end. Which check is most important?

A. Tighten one bolt fully before the other
B. Confirm groove dimensions, gasket condition, alignment, and bolt engagement
C. Lubricate the pipe exterior with any available oil
D. Use the coupling to correct an angled cut

25. At the pharmaceutical utility project, during troubleshooting, with a late field change, A threaded connection has sealant extending into the bore. What is the concern?

A. The sealant will always dissolve harmlessly
B. The joint becomes stronger when the bore is filled
C. Excess sealant can enter the system and restrict or contaminate the service
D. The excess proves the threads are fully engaged

26. At the pharmaceutical utility project, during maintenance, with a night-shift handover, A component rated below the line class is found in a spool. What is the correct response?

A. Hold the spool and obtain an approved replacement or disposition
B. Install it on the low side of the valve
C. Use it only during the pressure test
D. Paint it with the higher class identification

27. At the pharmaceutical utility project, during turnover, with a temporary support arrangement, A field measurement differs from the current drawing at a nozzle. What is the best next step?

A. Trim the spool to fit without updating the drawing
B. Move the nozzle with a chain hoist
C. Record the discrepancy and obtain controlled clarification
D. Use the measurement only if the pipe still connects

28. During shutdown at the pharmaceutical utility project, a drain rises 0.21 m over a 5 m horizontal run. What is the slope in percent?

A. 4.2
B. 105
C. 2380.95
D. 521

29. At the pharmaceutical utility project, during pre-job planning, with a restricted access route, A stainless component is stored against carbon-steel grinding debris. What control is needed?

A. Brush the debris away after installation
B. Separate and protect the material from contamination
C. Use carbon-steel wire wheels to clean it
D. Install it first and inspect only the outside

30. At the pharmaceutical utility project, during material receiving, with a replacement component, An insulated valve cannot be removed without dismantling adjacent piping. What does this indicate?

A. The valve is acceptable because it does not leak
B. The insulation should be permanently sealed around it
C. The adjacent pipe should be cut during every service
D. The installation lacks required maintenance access or removable provisions

31. At the pharmaceutical utility project, during layout, with a first-time crew member, A joint is scheduled for concealment, but its required inspection is incomplete. What should happen?

A. Photograph the joint and conceal it
B. Apply extra coating to protect the joint
C. Ask the next trade to inspect it later
D. Delay concealment until the inspection and disposition are complete

32. At the pharmaceutical utility project, during fabrication, with an unexpected instrument reading, A temporary jack is supporting a spool during fit-up. When may it be released?

A. As soon as the first bolt is tight
B. After permanent supports and the approved load path are complete
C. After the pipe is insulated
D. When the spool appears stable by eye

33. At the pharmaceutical utility project, during fit-up, with a scheduled outage, A plan drawing and an isometric show different pipe elevations. What should govern the work?

A. Use the controlled documents and resolve the discrepancy before fabrication
B. Use whichever elevation produces the shorter spool
C. Average the two elevations in the field
D. Follow the older drawing if it has more dimensions

34. At the pharmaceutical utility project, during installation, with a revised work package, An isometric shows a valve above a branch, but the elevation is unclear. What is the best check?

A. Scale the isometric with a ruler
B. Install the valve at the most accessible height
C. Compare plan, elevation, section, and field reference points
D. Infer the elevation from the pipe colour

35. At the pharmaceutical utility project, during pressure testing, with a crowded mechanical room, A cut piece has lost its material identification. What should happen before installation?

A. Segregate it and restore traceability through the approved process
B. Use it if the outside diameter matches
C. Install it in a low-pressure branch
D. Compare its weight with a known piece

36. At the pharmaceutical utility project, during start-up, with a newly isolated line, During fit-up, a spool aligns only when the pipe is forced sideways. What is correct?

A. Tighten the bolts to pull the faces together
B. Heat the flange until the misalignment disappears
C. Leave the temporary force in place after testing
D. Stop and correct the route, dimensions, or support arrangement

37. At the pharmaceutical utility project, during troubleshooting, with a late field change, A flange pair has uneven gaps before bolting. What should be checked first?

A. Increase bolt torque on the widest gap
B. Add a second gasket to fill the space
C. Alignment, face condition, gasket fit, and support before tightening
D. Use the bolts to draw the piping into position

38. At the pharmaceutical utility project, during maintenance, with a night-shift handover, A long straight run is anchored at both ends without a movement review. What concern is raised?

A. The pipe will always become self-supporting
B. Thermal movement may create excessive stress or load connected equipment
C. The anchors will eliminate all pressure drop
D. The line will automatically drain toward the centre

39. At the pharmaceutical utility project, during turnover, with a temporary support arrangement, A pipe passes through a rated wall. What installation detail is essential?

A. Pack the opening tightly with ordinary insulation
B. Weld the pipe directly to the wall sleeve
C. Provide the specified sleeve, clearance, and firestopping arrangement
D. Leave the opening open for future movement

40. At the pharmaceutical utility project, during shutdown, with a wet-weather condition, A pressure test includes a sensitive instrument that is not rated for the test pressure. What should happen?

A. Install a larger gauge beside it
B. Isolate or remove the instrument using the approved method
C. Proceed because the instrument is downstream
D. Cover the instrument with a rag during testing

41. At the pharmaceutical utility project, during pre-job planning, with a restricted access route, A valve's flow arrow conflicts with the intended service direction. What should be done?

A. Reverse the line flow during operation
B. Remove the arrow label
C. Install the valve and rely on the handle position
D. Stop and verify the valve selection and orientation before testing

42. At the pharmaceutical utility project, during material receiving, with a replacement component, A grooved coupling is being installed on a pipe end. Which check is most important?

A. Confirm groove dimensions, gasket condition, alignment, and bolt engagement
B. Tighten one bolt fully before the other
C. Lubricate the pipe exterior with any available oil
D. Use the coupling to correct an angled cut

43. At the pharmaceutical utility project, during layout, with a first-time crew member, A threaded connection has sealant extending into the bore. What is the concern?

A. The sealant will always dissolve harmlessly
B. Excess sealant can enter the system and restrict or contaminate the service
C. The joint becomes stronger when the bore is filled
D. The excess proves the threads are fully engaged

44. At the pharmaceutical utility project, during fabrication, with an unexpected instrument reading, A component rated below the line class is found in a spool. What is the correct response?

A. Install it on the low side of the valve
B. Use it only during the pressure test
C. Paint it with the higher class identification
D. Hold the spool and obtain an approved replacement or disposition

45. At the pharmaceutical utility project, during fit-up, with a scheduled outage, A field measurement differs from the current drawing at a nozzle. What is the best next step?

A. Record the discrepancy and obtain controlled clarification
B. Trim the spool to fit without updating the drawing
C. Move the nozzle with a chain hoist
D. Use the measurement only if the pipe still connects

46. At the pharmaceutical utility project, during installation, with a revised work package, A blind lift will pass behind a wall. Which control is most important?

A. Increase the lifting speed
B. Remove the exclusion zone
C. Use agreed communication and spotting
D. Let each worker give signals as needed

47. At the pharmaceutical utility project, during pressure testing, with a crowded mechanical room, A suspended load is ready to land on dunnage. What should happen before lowering?

A. Place hands under the load to guide it
B. Remove the tag lines before the load settles
C. Lower rapidly to prevent swinging
D. Confirm the landing surface, cribbing, clearances, and hand positions

48. At the pharmaceutical utility project, during start-up, with a newly isolated line, A hoist is rated for the load, but the hook is side-loaded. What is the concern?

A. Side loading improves hook capacity
B. The hook rating applies in every direction
C. It can damage the hook or hoist
D. The load will correct the hook angle automatically

49. At the pharmaceutical utility project, during troubleshooting, with a late field change, A lift plan changes because the original attachment point is inaccessible. What should happen?

A. Attach to the nearest handrail
B. Stop and revise the plan or obtain an approved alternative
C. Use a longer sling without recalculating
D. Proceed if the load is close to the original weight

50. At the pharmaceutical utility project, during maintenance, with a night-shift handover, Shock loading occurs when a slack sling suddenly takes the load. Why is it serious?

A. Dynamic force can exceed the working load
B. It reduces the load weight
C. It improves sling seating
D. It proves the sling has extra capacity

51. At the pharmaceutical utility project, during turnover, with a temporary support arrangement, Before selecting a sling for a spool, which information is essential?

A. Verified weight, centre of gravity, attachment points, and route
B. Only the pipe diameter and colour
C. The nearest hook size
D. The number of workers available

52. At the pharmaceutical utility project, during shutdown, with a wet-weather condition, As the angle of a two-leg sling becomes flatter, what happens to leg tension?

A. Leg tension decreases to zero
B. The load becomes self-balancing
C. Leg tension increases
D. The sling rating doubles automatically

53. At the pharmaceutical utility project, during pre-job planning, with a restricted access route, A load begins to rotate as it leaves the floor. What should the crew do?

A. Add speed to overcome the rotation
B. Catch the load by hand
C. Pull harder on one tag line
D. Stop and reassess the load

54. At the pharmaceutical utility project, during material receiving, with a replacement component, A sling has a cut and its identification tag is missing. What is correct?

A. Use it at half the listed load
B. Remove it from service and obtain identified, suitable equipment
C. Tie the cut closed with wire
D. Use it only for the first lift

55. At the pharmaceutical utility project, during layout, with a first-time crew member, Who should direct a lift when one signal system is required?

A. Any worker closest to the load
B. The person operating the tag line
C. The newest worker on the crew
D. The designated signal person identified in the lift plan

56. At the pharmaceutical utility project, during fabrication, with an unexpected instrument reading, A tag line is being used near a rotating load. Where should the handler stand?

A. Directly beneath the load
B. In a clear position outside the swing and line-of-fire zones
C. Between the load and a fixed structure
D. With the line wrapped around a wrist

57. At the pharmaceutical utility project, during fit-up, with a scheduled outage, A crane outriggers setup is close to an excavation edge. What must be verified?

A. Only the crane colour and boom length
B. Whether the excavation looks dry
C. Ground capacity, edge stability, and the approved setup distance
D. Whether the operator can see the load

58. At the pharmaceutical utility project, during installation, with a revised work package, A blind lift will pass behind a wall. Which control is most important?

A. Use agreed communication and spotting
B. Increase the lifting speed
C. Remove the exclusion zone
D. Let each worker give signals as needed

59. At the pharmaceutical utility project, during pressure testing, with a crowded mechanical room, A suspended load is ready to land on dunnage. What should happen before lowering?

A. Place hands under the load to guide it
B. Confirm the landing surface, cribbing, clearances, and hand positions
C. Remove the tag lines before the load settles
D. Lower rapidly to prevent swinging

60. At the pharmaceutical utility project, during start-up, with a newly isolated line, A hoist is rated for the load, but the hook is side-loaded. What is the concern?

A. It can damage the hook or hoist
B. Side loading improves hook capacity
C. The hook rating applies in every direction
D. The load will correct the hook angle automatically

61. At the pharmaceutical utility project, during troubleshooting, with a late field change, A steam user is cold while the supply valve is open. What is a logical first check?

A. Increase pressure without checking drainage
B. Close the return line
C. Remove the insulation immediately
D. Check flow, drainage, strainers, and return

62. At the pharmaceutical utility project, during maintenance, with a night-shift handover, A relief valve is isolated by a closed block valve during operation. What is the concern?

A. The relief valve will open more accurately
B. The block valve reduces all system pressure
C. The protected equipment may lose its required overpressure protection
D. The insulation becomes a secondary relief path

63. At the pharmaceutical utility project, during turnover, with a temporary support arrangement, Why is a drip leg installed on a steam line?

A. To increase steam velocity at every outlet
B. To replace the main steam trap
C. To prevent all thermal expansion
D. To collect and remove condensate from a low point

64. At the pharmaceutical utility project, during shutdown, with a wet-weather condition, A steam trap discharges continuously with a strong live-steam sound. What should be checked?

A. Increase the steam pressure immediately
B. Close every upstream drain
C. Trap condition, orientation, differential pressure, and downstream return
D. Remove the strainer permanently

65. At the pharmaceutical utility project, during pre-job planning, with a restricted access route, Water hammer follows rapid opening of a steam valve. What is the best response?

A. Open the valve farther to clear the noise
B. Control the valve, drain condensate, and review warm-up and slope
C. Remove the drip leg
D. Increase the return pressure

66. At the pharmaceutical utility project, during material receiving, with a replacement component, A steam strainer is installed with its basket access facing upward. What concern exists?

A. Maintenance may be difficult and debris may remain
B. The strainer will filter twice as well
C. The steam will become noncondensable
D. The orientation eliminates pressure drop

67. At the pharmaceutical utility project, during layout, with a first-time crew member, A condensate return line is flooded after a pressure reduction. What should be investigated?

A. Only the steam supply temperature
B. The colour of the insulation
C. The size of the nearest valve handle
D. Return pressure, trap operation, slope, check action, and receiver level

68. At the pharmaceutical utility project, during fabrication, with an unexpected instrument reading, Why are vents useful during steam-line warm-up?

A. They remove air during controlled warm-up
B. They replace pressure-relief devices
C. They increase condensate temperature instantly
D. They keep all valves locked open

69. At the pharmaceutical utility project, during fit-up, with a scheduled outage, A vacuum breaker is installed on a heat exchanger steam side. What does it help prevent?

A. All pressure excursions above the design limit
B. Reverse rotation of a condensate pump
C. Vacuum conditions that can interfere with drainage or damage equipment
D. Loss of insulation heat transfer

70. At the pharmaceutical utility project, during installation, with a revised work package, A high-pressure steam test boundary includes an unprotected relief path. What is required?

A. Raise pressure slowly without further review
B. Provide the specified protection before pressurizing
C. Use a lower-reading gauge only
D. Stand closer to watch the fittings

71. At the pharmaceutical utility project, during pressure testing, with a crowded mechanical room, A steam line expands into a guide during warm-up. What should be checked?

A. Tighten the guide until movement stops
B. Remove the nearest support
C. Add a rigid brace at the hot spot
D. Guide clearance, anchor location, support movement, and the designed expansion path

72. A valve seat at the pharmaceutical utility project experiences 100 kPa over an effective area of 0.02 m2. What force acts on that area?

A. 2
B. 5e+06
C. 2000
D. 100020

73. At the pharmaceutical utility project, during troubleshooting, with a late field change, A steam user is cold while the supply valve is open. What is a logical first check?

A. Check flow, drainage, strainers, and return
B. Increase pressure without checking drainage
C. Close the return line
D. Remove the insulation immediately

74. At the pharmaceutical utility project, during maintenance, with a night-shift handover, A relief valve is isolated by a closed block valve during operation. What is the concern?

A. The relief valve will open more accurately
B. The protected equipment may lose its required overpressure protection
C. The block valve reduces all system pressure
D. The insulation becomes a secondary relief path

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C. To collect and remove condensate from a low point
D. To prevent all thermal expansion

76. At the pharmaceutical utility project, during shutdown, with a wet-weather condition, A steam trap discharges continuously with a strong live-steam sound. What should be checked?

A. Trap condition, orientation, differential pressure, and downstream return
B. Increase the steam pressure immediately
C. Close every upstream drain
D. Remove the strainer permanently

77. At the pharmaceutical utility project, during pre-job planning, with a restricted access route, Water hammer follows rapid opening of a steam valve. What is the best response?

A. Open the valve farther to clear the noise
B. Remove the drip leg
C. Increase the return pressure
D. Control the valve, drain condensate, and review warm-up and slope

78. At the pharmaceutical utility project, during material receiving, with a replacement component, A steam strainer is installed with its basket access facing upward. What concern exists?

A. The strainer will filter twice as well
B. Maintenance may be difficult and debris may remain
C. The steam will become noncondensable
D. The orientation eliminates pressure drop

79. At the pharmaceutical utility project, during layout, with a first-time crew member, A condensate return line is flooded after a pressure reduction. What should be investigated?

A. Only the steam supply temperature
B. Return pressure, trap operation, slope, check action, and receiver level
C. The colour of the insulation
D. The size of the nearest valve handle

80. At the pharmaceutical utility project, during fabrication, with an unexpected instrument reading, Why are vents useful during steam-line warm-up?

A. They replace pressure-relief devices
B. They increase condensate temperature instantly
C. They remove air during controlled warm-up
D. They keep all valves locked open

81. At the pharmaceutical utility project, during fit-up, with a scheduled outage, A vacuum breaker is installed on a heat exchanger steam side. What does it help prevent?

A. Vacuum conditions that can interfere with drainage or damage equipment
B. All pressure excursions above the design limit
C. Reverse rotation of a condensate pump
D. Loss of insulation heat transfer

82. At the pharmaceutical utility project, during installation, with a revised work package, A high-pressure steam test boundary includes an unprotected relief path. What is required?

A. Raise pressure slowly without further review
B. Use a lower-reading gauge only
C. Stand closer to watch the fittings
D. Provide the specified protection before pressurizing

83. At the pharmaceutical utility project, during pressure testing, with a crowded mechanical room, A steam line expands into a guide during warm-up. What should be checked?

A. Tighten the guide until movement stops
B. Remove the nearest support
C. Guide clearance, anchor location, support movement, and the designed expansion path
D. Add a rigid brace at the hot spot

84. At the pharmaceutical utility project, during start-up, with a newly isolated line, Why is insulation installed after required steam testing and inspection?

A. Insulation creates the pressure boundary
B. Testing cannot be performed on bare pipe
C. Insulation prevents all condensate formation
D. It can conceal leaks and inspection points

85. At the pharmaceutical utility project, during troubleshooting, with a late field change, A fuel or process line is opened after isolation. What additional condition must be considered?

A. Consider residual pressure, vapour, liquid, and purge
B. Only the outside pipe temperature
C. Whether the valve handle is painted
D. The nearest electrical outlet

86. At the pharmaceutical utility project, during maintenance, with a night-shift handover, A medical-gas connection is clean but not positively identified. What should happen?

A. Connect it because the fitting matches
B. Hold the connection until the gas identity and destination are verified
C. Use colour alone as proof
D. Test it by opening the source briefly

87. At the pharmaceutical utility project, during turnover, with a temporary support arrangement, A hydronic pump runs, but the terminal coil has little flow. What should be checked first?

A. Increase the setpoint without measuring flow
B. Insulate the pump casing more heavily
C. Close the return valve completely
D. Check valves, air, strainers, rotation, and flow

88. At the pharmaceutical utility project, during shutdown, with a wet-weather condition, Why is an expansion tank used in a closed hydronic system?

A. To remove all suspended solids
B. To replace the circulating pump
C. To accommodate fluid volume change as temperature changes
D. To set the valve fail position

89. At the pharmaceutical utility project, during pre-job planning, with a restricted access route, A hydronic loop contains air after filling. What effect can result?

A. Noise, unstable flow, poor heat transfer, and unreliable balancing
B. Higher heat transfer at every coil
C. Automatic removal of all debris
D. Permanent elimination of pressure drop

90. At the pharmaceutical utility project, during material receiving, with a replacement component, A coil connection imposes visible strain on the equipment nozzle. What is correct?

A. Tighten the flange until the strain disappears
B. Correct the piping support or alignment before operating the equipment
C. Add a heavier gasket
D. Start the pump to pull the pipe into place

91. At the pharmaceutical utility project, during layout, with a first-time crew member, A cooling system has a large temperature difference and low flow. What should be investigated?

A. Only the room thermostat
B. Restriction, valve position, air, pump condition, and coil cleanliness
C. The pipe colour and insulation label
D. The relief valve spring

92. At the pharmaceutical utility project, during fabrication, with an unexpected instrument reading, What is the purpose of balancing a hydronic system?

A. To make every branch the same length
B. To eliminate the need for controls
C. To distribute design flow so connected loads receive the intended service
D. To increase pressure drop without limit

93. At the pharmaceutical utility project, during fit-up, with a scheduled outage, A process line carries an abrasive slurry. Which selection principle is most important?

A. Match material, wall, fittings, and joining method to the service
B. Use the lightest pipe that fits the dimension
C. Select components by colour only
D. Use a water-service gasket without review

94. At the pharmaceutical utility project, during installation, with a revised work package, A heat exchanger is installed with the wrong flow direction. What can happen?

A. The exchanger will always self-correct
B. The wrong direction improves all heat transfer
C. The pipe supports eliminate the effect
D. Performance, control response, and temperature approach can be affected

95. At the pharmaceutical utility project, during pressure testing, with a crowded mechanical room, A control valve hunts while the process temperature varies. What should be checked?

A. Sensor location, valve authority, actuator response, and operating conditions
B. Disable the controller permanently
C. Close the bypass without measuring
D. Increase the setpoint until hunting stops

96. At the pharmaceutical utility project, during start-up, with a newly isolated line, A flexible connector is installed in a way that carries pipe weight. What is the concern?

A. The connector becomes a permanent support
B. Flexibility removes the need for anchors
C. The weight improves vibration isolation
D. It may be overloaded or move improperly

97. At the pharmaceutical utility project, during troubleshooting, with a late field change, A fuel or process line is opened after isolation. What additional condition must be considered?

A. Only the outside pipe temperature
B. Consider residual pressure, vapour, liquid, and purge
C. Whether the valve handle is painted
D. The nearest electrical outlet

98. At the pharmaceutical utility project, during maintenance, with a night-shift handover, A medical-gas connection is clean but not positively identified. What should happen?

A. Connect it because the fitting matches
B. Use colour alone as proof
C. Hold the connection until the gas identity and destination are verified
D. Test it by opening the source briefly

99. At the pharmaceutical utility project, water moves through an effective area of 0.014 m2 at 2 m/s. What is the flow in L/s?

A. 7
B. 28
C. 142.86
D. 2014

100. At the pharmaceutical utility project, during shutdown, with a wet-weather condition, Why is an expansion tank used in a closed hydronic system?

A. To remove all suspended solids
B. To replace the circulating pump
C. To accommodate fluid volume change as temperature changes
D. To set the valve fail position

101. At the pharmaceutical utility project, during pre-job planning, with a restricted access route, A hydronic loop contains air after filling. What effect can result?

A. Noise, unstable flow, poor heat transfer, and unreliable balancing
B. Higher heat transfer at every coil
C. Automatic removal of all debris
D. Permanent elimination of pressure drop

102. At the pharmaceutical utility project, during material receiving, with a replacement component, A coil connection imposes visible strain on the equipment nozzle. What is correct?

A. Tighten the flange until the strain disappears
B. Add a heavier gasket
C. Start the pump to pull the pipe into place
D. Correct the piping support or alignment before operating the equipment

103. At the pharmaceutical utility project, during layout, with a first-time crew member, A cooling system has a large temperature difference and low flow. What should be investigated?

A. Only the room thermostat
B. Restriction, valve position, air, pump condition, and coil cleanliness
C. The pipe colour and insulation label
D. The relief valve spring

104. At the pharmaceutical utility project, during fabrication, with an unexpected instrument reading, What is the purpose of balancing a hydronic system?

A. To make every branch the same length
B. To eliminate the need for controls
C. To increase pressure drop without limit
D. To distribute design flow so connected loads receive the intended service

105. At the pharmaceutical utility project, during fit-up, with a scheduled outage, A process line carries an abrasive slurry. Which selection principle is most important?

A. Use the lightest pipe that fits the dimension
B. Select components by colour only
C. Match material, wall, fittings, and joining method to the service
D. Use a water-service gasket without review

106. At the pharmaceutical utility project, during installation, with a revised work package, A heat exchanger is installed with the wrong flow direction. What can happen?

A. Performance, control response, and temperature approach can be affected
B. The exchanger will always self-correct
C. The wrong direction improves all heat transfer
D. The pipe supports eliminate the effect

107. At the pharmaceutical utility project, during pressure testing, with a crowded mechanical room, A control valve hunts while the process temperature varies. What should be checked?

A. Sensor location, valve authority, actuator response, and operating conditions
B. Disable the controller permanently
C. Close the bypass without measuring
D. Increase the setpoint until hunting stops

108. At the pharmaceutical utility project, during start-up, with a newly isolated line, A flexible connector is installed in a way that carries pipe weight. What is the concern?

A. The connector becomes a permanent support
B. It may be overloaded or move improperly
C. Flexibility removes the need for anchors
D. The weight improves vibration isolation

109. At the pharmaceutical utility project, during troubleshooting, with a late field change, A fuel or process line is opened after isolation. What additional condition must be considered?

A. Only the outside pipe temperature
B. Whether the valve handle is painted
C. Consider residual pressure, vapour, liquid, and purge
D. The nearest electrical outlet

110. At the pharmaceutical utility project, during maintenance, with a night-shift handover, A medical-gas connection is clean but not positively identified. What should happen?

A. Connect it because the fitting matches
B. Use colour alone as proof
C. Test it by opening the source briefly
D. Hold the connection until the gas identity and destination are verified

111. At the pharmaceutical utility project, during turnover, with a temporary support arrangement, A hydronic pump runs, but the terminal coil has little flow. What should be checked first?

A. Increase the setpoint without measuring flow
B. Insulate the pump casing more heavily
C. Check valves, air, strainers, rotation, and flow
D. Close the return valve completely

112. At the pharmaceutical utility project, during shutdown, with a wet-weather condition, A geothermal loop shows poor heat transfer after commissioning. What is a logical check?

A. Increase pressure without measuring flow
B. Check balance, air, fluid, readings, and controls
C. Replace every valve immediately
D. Disable the temperature sensors

113. At the pharmaceutical utility project, during pre-job planning, with a restricted access route, A heat-pump system enters defrost mode. What should the technician recognize?

A. The system may temporarily reverse or change its normal heat-transfer sequence
B. The system has necessarily failed
C. All pumps must be shut off permanently
D. The relief valve should be isolated

114. At the pharmaceutical utility project, during material receiving, with a replacement component, A biomass heating loop includes a storage tank. Why is the tank important?

A. It replaces all relief protection
B. It prevents every pressure change
C. It eliminates the need for temperature sensors
D. It buffers heat production and system demand

115. At the pharmaceutical utility project, during layout, with a first-time crew member, A renewable-energy system has a sensor installed on an unrepresentative pipe section. What risk exists?

A. Controls may respond to the wrong temperature or operating condition
B. The sensor will average every system temperature
C. The pipe insulation will correct the reading
D. The pump will automatically relocate the sensor

116. At the pharmaceutical utility project, during fabrication, with an unexpected instrument reading, A solar loop reaches a high temperature while the pump is off. What must be considered?

A. Only the normal operating temperature
B. Stagnation temperature, relief protection, expansion, and approved shutdown logic
C. Removing the relief device
D. Opening an unapproved drain to atmosphere

117. At the pharmaceutical utility project, during fit-up, with a scheduled outage, A heat-recovery loop is connected to a process exchanger. What must be confirmed?

A. Only the nominal pipe size
B. That all branches have identical temperatures
C. Compatibility, flow direction, controls, relief, and the expected operating modes
D. That the exchanger can be bypassed permanently

118. At the pharmaceutical utility project, during installation, with a revised work package, Before starting a renewable-energy skid, what is the best readiness check?

A. Start the pump and correct defects while running
B. Remove all guards for visibility
C. Open every isolation valve regardless of the procedure
D. Confirm supports, valves, sensors, relief devices, controls, labels, and test records

119. At the pharmaceutical utility project, during pressure testing, with a crowded mechanical room, A solar-thermal loop is exposed to freezing weather during shutdown. What should be verified?

A. Only the collector colour
B. The pump speed at full output
C. That every valve is permanently open
D. Freeze protection, drain or circulation mode, insulation, and control response

120. At the pharmaceutical utility project, during start-up, with a newly isolated line, When should temporary test hoses and jumpers be removed?

A. After the test and restoration procedure identifies them for removal
B. Whenever they obstruct a walkway
C. Before the test result is recorded
D. Only if the operator notices them

121. At the pharmaceutical utility project, during troubleshooting, with a late field change, A turnover package is missing a pressure-test record. What should happen?

A. Mark the package complete because the line is operating
B. Hold acceptance until the record is recovered or the test is repeated as required
C. Use a nearby test record
D. Create a result from the design pressure

122. At the pharmaceutical utility project, during maintenance, with a night-shift handover, A restart after a protective trip is requested. What must be checked first?

A. Only the reset button
B. The colour of the alarm light
C. Cause, safe condition, reset authority, and the required retest
D. Whether the shift is nearly finished

123. At the pharmaceutical utility project, during turnover, with a temporary support arrangement, A commissioning team is ready to start equipment, but several protective devices are untested. What should happen?

A. Start at reduced speed without the devices
B. Hold the start until prerequisites and safety functions are verified
C. Bypass the devices temporarily
D. Accept the risk because the equipment is new

124. At the pharmaceutical utility project, during shutdown, with a wet-weather condition, What is the purpose of a functional test?

A. To replace all installation inspections
B. To make the equipment appear complete
C. To demonstrate that commands, responses, indications, and protections work as intended
D. To eliminate the need for turnover records

125. At the pharmaceutical utility project, during pre-job planning, with a restricted access route, A pump runs during start-up, but no flow is indicated. What is the best response?

A. Stabilize and verify rotation, valves, air, level, and flow
B. Increase speed until flow appears
C. Assume the instrument is wrong
D. Open every valve without checking the procedure

126. At the pharmaceutical utility project, during material receiving, with a replacement component, A control interlock trips during a test. What should the team do?

A. Reset repeatedly until the test passes
B. Disable the interlock for the remaining tests
C. Delete the alarm from the record
D. Record the condition, stabilize the system, and investigate before resetting

127. At the pharmaceutical utility project, during layout, with a first-time crew member, What should a punch list entry contain?

A. A clear deficiency, location, responsible party, disposition, and status
B. Only the name of the worker who found it
C. A general note that work remains
D. A photograph without a description

128. At the pharmaceutical utility project, during fabrication, with an unexpected instrument reading, An as-built drawing differs from the installed route. What is required?

A. Keep the original because it was approved
B. Update the record so it reflects the accepted field condition
C. Erase the changed route from the field copy
D. Wait for maintenance to redraw it later

129. At the pharmaceutical utility project, during fit-up, with a scheduled outage, A test result is outside the expected range but the equipment still runs. What is correct?

A. Round the result to the expected value
B. Accept it because the motor runs
C. Record the deviation and obtain a technical disposition before acceptance
D. Change the alarm limit without approval

130. At the pharmaceutical utility project, during installation, with a revised work package, When should temporary test hoses and jumpers be removed?

A. Whenever they obstruct a walkway
B. Before the test result is recorded
C. Only if the operator notices them
D. After the test and restoration procedure identifies them for removal

Practice Exam 19: Answer Key and Explanations

1. B — B — Stop, isolate the tool, and inspect the wheel and installation. Abnormal vibration can indicate damage, imbalance, incorrect fit, or a failing component. The other choices miss continued operation of a potentially defective tool. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

2. D — D — Do not use it until the contents are positively identified and labelled. Positive identification prevents exposure, incompatibility, and incorrect disposal. The other choices miss guessing the identity of a hazardous product. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

3. D — D — When the authorized tester confirms the required conditions and records them. Permit conditions require measured, authorized, and documented verification. The other choices miss substituting observation for a required test. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

4. C — C — Stop, report the condition, and review the task and exposure controls. Early reporting allows the task, tool, duration, and controls to be reviewed. The other choices miss normalizing a possible exposure-related symptom. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

5. B — B — Move clear, control the release, and reassess the isolation and energy state. Unexpected release indicates that the assumed energy state may be wrong. The other choices miss the line of fire and unverified isolation. Use the current drawing or procedure, perform the approved step, and verify the result.

6. A — A — Review the load path, exclusion zone, signals, and stop command. Everyone in the lift area must understand movement, communication, and stop controls. The other choices miss the shared lift plan and exclusion boundary. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

7. A — A — Identify every energy source and the approved isolation method. Energy control begins with positive identification and an approved isolation plan. The other choices miss the need to identify and control stored energy. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

8. B — B — 3.5 inches equals 88.9 millimetres. Multiplying inches by 25.4 converts the given length to millimetres. The other choices miss the correct length conversion factor. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system. This sequence controls the hazard and supports a defensible decision.

9. C — C — Read the current safety data sheet and confirm compatibility. The safety data sheet and service specification establish hazards and compatibility. The other choices miss product identity and service compatibility. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

10. D — D — Confirm authorization, remove or protect combustibles, and provide fire watch. Hot work requires controls for ignition, combustibles, sparks, and the surrounding area. The other choices miss the hot-work permit and surrounding fire hazards. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

11. A — A — Stop and follow the confined-space entry and rescue procedure. Confined-space hazards can include atmosphere, engulfment, access, and rescue limitations. The other choices miss the required assessment and rescue controls. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

12. B — B — Remove the debris and restore a clear, controlled work area. Housekeeping controls slips, trips, fire exposure, and interference with emergency access. The other choices miss the obligation to leave a safe work area. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

13. C — C — Remove it from service and obtain a suitable verified instrument. A damaged or unverified gauge cannot provide reliable evidence of system condition. The other choices miss instrument integrity and reliable verification. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

14. B — B — Pause the handover and reconcile the information before work continues. Conflicting information can change the isolation, service, and hazard assessment. The other choices miss the need for controlled communication and confirmation. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

15. D — D — Plan the route, use suitable handling aids, and control pinch points. Manual handling must control weight, balance, route, and line-of-fire hazards. The other choices miss uncontrolled force and pinch-point exposure. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

16. C — C — Stop the source if safe, control ignition, and follow the spill procedure. Spill response must protect people, the environment, and ignition control. The other choices miss containment and the approved response procedure. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

17. D — D — Segregate it and restore traceability through the approved process. Traceability proves that the material, schedule, and service are acceptable. The other choices miss appearance as a substitute for material identity. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

18. A — A — Stop and correct the route, dimensions, or support arrangement. Forced alignment can load joints, equipment nozzles, and supports. The other choices miss using assembly force to hide a layout error. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

19. A — A — Alignment, face condition, gasket fit, and support before tightening. Correct fit-up prevents gasket damage, leakage, and imposed pipe strain. The other choices miss forcing the joint closed. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

20. B — B — Thermal movement may create excessive stress or load connected equipment. Anchors, guides, and expansion arrangements must work as a planned system. The other choices miss ignoring thermal movement and restraint forces. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

21. C — C — Provide the specified sleeve, clearance, and firestopping arrangement. Penetration details protect the wall function while accommodating the pipe system. The other choices miss unapproved materials and loss of the wall rating. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

22. D — D — Isolate or remove the instrument using the approved method. The test boundary must protect components that cannot tolerate the test condition. The other choices miss assuming distance alone protects a component. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

23. D — D — Stop and verify the valve selection and orientation before testing. Flow direction can control valve function, check action, and pressure behaviour. The other choices miss treating orientation as cosmetic. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

24. B — B — Confirm groove dimensions, gasket condition, alignment, and bolt engagement. Grooved joints depend on correct preparation, gasket, alignment, and tightening. The other choices miss using the coupling to compensate for defective preparation. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

25. C — C — Excess sealant can enter the system and restrict or contaminate the service. Sealant must support sealing without entering a sensitive flow path. The other choices miss contamination and restriction inside the system. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

26. A — A — Hold the spool and obtain an approved replacement or disposition. Every pressure-boundary component must be suitable for the specified service. The other choices miss rating substitution without engineering approval. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

27. C — C — Record the discrepancy and obtain controlled clarification. A field change affecting fit or function must be controlled and documented. The other choices miss making an irreversible change from an unapproved discrepancy. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

28. A — A — the slope is 4.2 percent. Slope percentage is calculated as rise divided by run, multiplied by 100. The other choices miss the relationship between rise and run. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

29. B — B — Separate and protect the material from contamination. Contamination can damage material performance and service cleanliness. The other choices miss cross-contamination during storage and preparation. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system. This sequence controls the hazard and supports a defensible decision.

30. D — D — The installation lacks required maintenance access or removable provisions. Correct layout includes operation, inspection, removal, and future maintenance. The other choices miss ignoring the life-cycle access requirement. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

31. D — D — Delay concealment until the inspection and disposition are complete. Hold points protect acceptance before the work becomes inaccessible. The other choices miss using a photograph as a substitute for required inspection. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

32. B — B — After permanent supports and the approved load path are complete. Temporary aids do not replace engineered or specified permanent supports. The other choices miss releasing a load before the permanent support system is ready. Use the current drawing or procedure, perform the approved step, and verify the result.

33. A — A — Use the controlled documents and resolve the discrepancy before fabrication. A controlled discrepancy must be resolved before an irreversible layout or cut. The other choices miss revision control and field verification. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

34. C — C — Compare plan, elevation, section, and field reference points. Multiple views and reliable benchmarks establish three-dimensional location. The other choices miss the limits of scaling a drawing. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

35. A — A — Segregate it and restore traceability through the approved process. Traceability proves that the material, schedule, and service are acceptable. The other choices miss appearance as a substitute for material identity. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

36. D — D — Stop and correct the route, dimensions, or support arrangement. Forced alignment can load joints, equipment nozzles, and supports. The other choices miss using assembly force to hide a layout error. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

37. C — C — Alignment, face condition, gasket fit, and support before tightening. Correct fit-up prevents gasket damage, leakage, and imposed pipe strain. The other choices miss forcing the joint closed. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

38. B — B — Thermal movement may create excessive stress or load connected equipment. Anchors, guides, and expansion arrangements must work as a planned system. The other choices miss ignoring thermal movement and restraint forces. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

39. C — C — Provide the specified sleeve, clearance, and firestopping arrangement. Penetration details protect the wall function while accommodating the pipe system. The other choices miss unapproved materials and loss of the wall rating. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

40. B — B — Isolate or remove the instrument using the approved method. The test boundary must protect components that cannot tolerate the test condition. The other choices miss assuming distance alone protects a component. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

41. D — D — Stop and verify the valve selection and orientation before testing. Flow direction can control valve function, check action, and pressure behaviour. The other choices miss treating orientation as cosmetic. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

42. A — A — Confirm groove dimensions, gasket condition, alignment, and bolt engagement. Grooved joints depend on correct preparation, gasket, alignment, and tightening. The other choices miss using the coupling to compensate for defective preparation. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

43. B — B — Excess sealant can enter the system and restrict or contaminate the service. Sealant must support sealing without entering a sensitive flow path. The other choices miss contamination and restriction inside the system. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

44. D — D — Hold the spool and obtain an approved replacement or disposition. Every pressure-boundary component must be suitable for the specified service. The other choices miss rating substitution without engineering approval. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

45. A — A — Record the discrepancy and obtain controlled clarification. A field change affecting fit or function must be controlled and documented. The other choices miss making an irreversible change from an unapproved discrepancy. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

46. C — C — Use agreed communication and spotting. Blind lifts require reliable communication, visibility through spotters, and a stop command. The other choices miss loss of shared control during a blind movement. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

47. D — D — Confirm the landing surface, cribbing, clearances, and hand positions. Landing creates crush, roll, and instability hazards that must be controlled. The other choices miss hands and feet in the landing zone. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

48. C — C — It can damage the hook or hoist. Hoists and hooks are designed for the specified line of pull. The other choices miss an unintended force direction. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

49. B — B — Stop and revise the plan or obtain an approved alternative. A changed attachment point can alter capacity, balance, and structural loading. The other choices miss changing the load path without review. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

50. A — A — Dynamic force can exceed the working load. Dynamic effects can create forces much higher than a steady lift. The other choices miss assuming rated capacity covers impact loading. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

51. A — A — Verified weight, centre of gravity, attachment points, and route. Rigging begins with the load and the complete path to the landing area. The other choices miss the load-path information needed for a safe lift. Use the current drawing or procedure, perform the approved step, and verify the result.

52. C — C — Leg tension increases. A flatter sling angle increases the force in each leg. The other choices miss the effect of sling geometry on tension. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system. This sequence controls the hazard and supports a defensible decision.

53. D — D — Stop and reassess the load. Unexpected rotation indicates that the planned load path or balance is not confirmed. The other choices miss continuing an unstable movement. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

54. B — B — Remove it from service and obtain identified, suitable equipment. Condition and identification are both necessary to establish lifting capacity. The other choices miss using damaged or unverified rigging. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

55. D — D — The designated signal person identified in the lift plan. One recognized signal source prevents conflicting commands. The other choices miss multiple or ambiguous signals. Use the current

drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system. This sequence controls the hazard and supports a defensible decision.

56. B — B — In a clear position outside the swing and line-of-fire zones. Tag lines control orientation only when the handler remains clear of hazards. The other choices miss placing the worker in the load path. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

57. C — C — Ground capacity, edge stability, and the approved setup distance. Ground and edge conditions can affect crane stability and capacity. The other choices miss visual judgment without a setup assessment. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

58. A — A — Use agreed communication and spotting. Blind lifts require reliable communication, visibility through spotters, and a stop command. The other choices miss loss of shared control during a blind movement. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

59. B — B — Confirm the landing surface, cribbing, clearances, and hand positions. Landing creates crush, roll, and instability hazards that must be controlled. The other choices miss hands and feet in the landing zone. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

60. A — A — It can damage the hook or hoist. Hoists and hooks are designed for the specified line of pull. The other choices miss an unintended force direction. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

61. D — D — Check flow, drainage, strainers, and return. Poor heat transfer can result from blocked flow, flooded equipment, or return problems. The other choices miss changing pressure before finding the restriction. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

62. C — C — The protected equipment may lose its required overpressure protection. Relief protection must remain available in the configuration required for service. The other choices miss defeating a safety function. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

63. D — D — To collect and remove condensate from a low point. Condensate collects at low points and must be drained before it causes unstable flow. The other choices miss the purpose of low-point condensate management. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

64. C — C — Trap condition, orientation, differential pressure, and downstream return. Continuous discharge can indicate failed internals, incorrect conditions, or return problems. The other choices miss diagnosing from the whole trap arrangement. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

65. B — B — Control the valve, drain condensate, and review warm-up and slope. Rapid admission can move accumulated condensate at high velocity. The other choices miss treating water hammer as normal operation. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

66. A — A — Maintenance may be difficult and debris may remain. Strainer orientation must support collection, drainage, and service access. The other choices miss ignoring orientation and maintenance. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system. This sequence controls the hazard and supports a defensible decision.

67. D — D — Return pressure, trap operation, slope, check action, and receiver level. Flooding can result from backpressure, poor drainage, failed traps, or restricted return. The other choices miss a connected return-system diagnosis. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

68. A — A — They remove air during controlled warm-up. Air removal and gradual heating reduce uneven temperature and unstable operation. The other choices miss the difference between venting and relieving pressure. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

69. C — C — Vacuum conditions that can interfere with drainage or damage equipment. Condensing steam can reduce pressure and create vacuum conditions. The other choices miss confusing vacuum protection with overpressure protection. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

70. B — B — Provide the specified protection before pressurizing. High-pressure tests require a defined boundary and protection appropriate to stored energy. The other choices miss treating slow pressurization as the only control. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

71. D — D — Guide clearance, anchor location, support movement, and the designed expansion path. Thermal movement must be directed by the support and restraint arrangement. The other choices miss blocking intended movement. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

72. C — C — the force is 2000 newtons. Pressure must be converted to pascals before multiplying by area in square metres. The other choices miss unit conversion and the pressure-area relationship. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

73. A — A — Check flow, drainage, strainers, and return. Poor heat transfer can result from blocked flow, flooded equipment, or return problems. The other choices miss changing pressure before finding the restriction. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

74. B — B — The protected equipment may lose its required overpressure protection. Relief protection must remain available in the configuration required for service. The other choices miss defeating a safety function. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

75. C — C — To collect and remove condensate from a low point. Condensate collects at low points and must be drained before it causes unstable flow. The other choices miss the purpose of low-point condensate management. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

76. A — A — Trap condition, orientation, differential pressure, and downstream return. Continuous discharge can indicate failed internals, incorrect conditions, or return problems. The other choices miss diagnosing from the whole trap arrangement. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

77. D — D — Control the valve, drain condensate, and review warm-up and slope. Rapid admission can move accumulated condensate at high velocity. The other choices miss treating water hammer as normal operation. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

78. B — B — Maintenance may be difficult and debris may remain. Strainer orientation must support collection, drainage, and service access. The other choices miss ignoring orientation and maintenance. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system. This sequence controls the hazard and supports a defensible decision.

79. B — B — Return pressure, trap operation, slope, check action, and receiver level. Flooding can result from backpressure, poor drainage, failed traps, or restricted return. The other choices miss a connected return-system diagnosis. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

80. C — C — They remove air during controlled warm-up. Air removal and gradual heating reduce uneven temperature and unstable operation. The other choices miss the difference between venting and relieving pressure. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

81. A — A — Vacuum conditions that can interfere with drainage or damage equipment. Condensing steam can reduce pressure and create vacuum conditions. The other choices miss confusing vacuum protection with overpressure protection. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

82. D — D — Provide the specified protection before pressurizing. High-pressure tests require a defined boundary and protection appropriate to stored energy. The other choices miss treating slow pressurization as the only control. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

83. C — C — Guide clearance, anchor location, support movement, and the designed expansion path. Thermal movement must be directed by the support and restraint arrangement. The other choices miss blocking intended movement. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

84. D — D — It can conceal leaks and inspection points. Concealment should follow verification of the pressure boundary and accessible inspection points. The other choices miss hiding work before acceptance. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

85. A — A — Consider residual pressure, vapour, liquid, and purge. Isolation does not automatically remove trapped medium or hazardous residue. The other choices miss line-breaking hazards. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system. This sequence controls the hazard and supports a defensible decision.

86. B — B — Hold the connection until the gas identity and destination are verified. Wrong-gas connections can be dangerous even when the mechanical fit is correct. The other choices miss positive identification and cleanliness together. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

87. D — D — Check valves, air, strainers, rotation, and flow. Flow problems require checking the complete circuit before changing controls. The other choices miss a whole-loop diagnosis. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system. This sequence controls the hazard and supports a defensible decision.

88. C — C — To accommodate fluid volume change as temperature changes. Fluid expands when heated, so the system needs a controlled volume and pressure response. The other choices miss the purpose of expansion control. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

89. A — A — Noise, unstable flow, poor heat transfer, and unreliable balancing. Air interrupts circulation and changes the readings used for performance decisions. The other choices miss air effects in a closed loop. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

90. B — B — Correct the piping support or alignment before operating the equipment. Equipment connections should not carry unintended installation loads. The other choices miss forcing piping into equipment alignment. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

91. B — B — Restriction, valve position, air, pump condition, and coil cleanliness. The combined symptom points toward a flow or heat-transfer problem. The other choices miss isolating the diagnosis

to the thermostat. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

92. C — C — To distribute design flow so connected loads receive the intended service. Balancing coordinates branch resistance and available flow across the system. The other choices miss confusing balance with identical piping. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

93. A — A — Match material, wall, fittings, and joining method to the service. Abrasive service can accelerate wear and make ordinary materials unsuitable. The other choices miss service compatibility and wear. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

94. D — D — Performance, control response, and temperature approach can be affected. Heat-transfer equipment relies on the specified flow arrangement. The other choices miss treating orientation as a cosmetic issue. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

95. A — A — Sensor location, valve authority, actuator response, and operating conditions. Control instability can involve sensing, sizing, authority, or process response. The other choices miss changing a setting without diagnosing the loop. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

96. D — D — It may be overloaded or move improperly. Flexible elements need correct support and alignment to manage movement or vibration. The other choices miss using a connector as a structural support. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

97. B — B — Consider residual pressure, vapour, liquid, and purge. Isolation does not automatically remove trapped medium or hazardous residue. The other choices miss line-breaking hazards. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system. This sequence controls the hazard and supports a defensible decision.

98. C — C — Hold the connection until the gas identity and destination are verified. Wrong-gas connections can be dangerous even when the mechanical fit is correct. The other choices miss positive identification and cleanliness together. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

99. B — B — the flow is 28 litres per second. Flow is area multiplied by velocity, followed by conversion from cubic metres per second to litres per second. The other choices miss the required flow relationship and unit conversion. Use the current drawing or procedure, perform the approved step, and verify the result.

100. C — C — To accommodate fluid volume change as temperature changes. Fluid expands when heated, so the system needs a controlled volume and pressure response. The other choices miss the

purpose of expansion control. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

101. A — A — Noise, unstable flow, poor heat transfer, and unreliable balancing. Air interrupts circulation and changes the readings used for performance decisions. The other choices miss air effects in a closed loop. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

102. D — D — Correct the piping support or alignment before operating the equipment. Equipment connections should not carry unintended installation loads. The other choices miss forcing piping into equipment alignment. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

103. B — B — Restriction, valve position, air, pump condition, and coil cleanliness. The combined symptom points toward a flow or heat-transfer problem. The other choices miss isolating the diagnosis to the thermostat. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

104. D — D — To distribute design flow so connected loads receive the intended service. Balancing coordinates branch resistance and available flow across the system. The other choices miss confusing balance with identical piping. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

105. C — C — Match material, wall, fittings, and joining method to the service. Abrasive service can accelerate wear and make ordinary materials unsuitable. The other choices miss service compatibility and wear. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

106. A — A — Performance, control response, and temperature approach can be affected. Heat-transfer equipment relies on the specified flow arrangement. The other choices miss treating orientation as a cosmetic issue. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

107. A — A — Sensor location, valve authority, actuator response, and operating conditions. Control instability can involve sensing, sizing, authority, or process response. The other choices miss changing a setting without diagnosing the loop. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

108. B — B — It may be overloaded or move improperly. Flexible elements need correct support and alignment to manage movement or vibration. The other choices miss using a connector as a structural support. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

109. C — C — Consider residual pressure, vapour, liquid, and purge. Isolation does not automatically remove trapped medium or hazardous residue. The other choices miss line-breaking hazards. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final

condition before restoring the system. This sequence controls the hazard and supports a defensible decision.

110. D — D — Hold the connection until the gas identity and destination are verified. Wrong-gas connections can be dangerous even when the mechanical fit is correct. The other choices miss positive identification and cleanliness together. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

111. C — C — Check valves, air, strainers, rotation, and flow. Flow problems require checking the complete circuit before changing controls. The other choices miss a whole-loop diagnosis. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system. This sequence controls the hazard and supports a defensible decision.

112. B — B — Check balance, air, fluid, readings, and controls. Performance depends on circulation, heat exchange, fluid condition, and accurate control. The other choices miss a measured system diagnosis. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

113. A — A — The system may temporarily reverse or change its normal heat-transfer sequence. Operating modes can intentionally change flow and temperature to remove frost. The other choices miss confusing a designed mode with a fault. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

114. D — D — It buffers heat production and system demand. Thermal storage helps match source output with changing system demand. The other choices miss the role of storage in system control. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

115. A — A — Controls may respond to the wrong temperature or operating condition. Sensor location determines whether the control signal represents the intended condition. The other choices miss measurement location and control response. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

116. B — B — Stagnation temperature, relief protection, expansion, and approved shutdown logic. Renewable sources can continue adding energy when circulation is unavailable. The other choices miss off-normal temperature and stored energy. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

117. C — C — Compatibility, flow direction, controls, relief, and the expected operating modes. Recovery systems interact with source, load, and control conditions. The other choices miss system integration rather than size alone. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

118. D — D — Confirm supports, valves, sensors, relief devices, controls, labels, and test records. Start-up should follow completion and readiness verification, not discoverability by operation. The other

choices miss pre-start completeness and controlled energization. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

119. D — D — Freeze protection, drain or circulation mode, insulation, and control response. Renewable systems can change mode with ambient conditions and available energy. The other choices miss the complete freeze-protection strategy. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

120. A — A — After the test and restoration procedure identifies them for removal. Temporary items can change the operating configuration and must be controlled. The other choices miss restoring the intended line-up. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

121. B — B — Hold acceptance until the record is recovered or the test is repeated as required. Records are evidence that the required acceptance activity occurred. The other choices miss substituting assumption for a traceable record. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

122. C — C — Cause, safe condition, reset authority, and the required retest. Restarting without understanding a trip can repeat the hazard or damage. The other choices miss controlled recovery after a protection event. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

123. B — B — Hold the start until prerequisites and safety functions are verified. Commissioning proves readiness and protection before introducing operating energy. The other choices miss starting incomplete or unprotected equipment. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

124. C — C — To demonstrate that commands, responses, indications, and protections work as intended. Functional tests connect the installed system to its intended operating behaviour. The other choices miss the difference between testing and appearance. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

125. A — A — Stabilize and verify rotation, valves, air, level, and flow. A running motor does not prove that the fluid path or pump performance is correct. The other choices miss independent evidence of actual flow. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

126. D — D — Record the condition, stabilize the system, and investigate before resetting. A protective trip is evidence that requires diagnosis, not concealment. The other choices miss preserving the meaning of a safety response. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

127. A — A — A clear deficiency, location, responsible party, disposition, and status. Turnover depends on deficiencies being traceable and closed or formally accepted. The other choices miss actionable

deficiency control. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

128. B — B — Update the record so it reflects the accepted field condition. Future isolation and maintenance depend on accurate system information. The other choices miss documenting the accepted installation. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

129. C — C — Record the deviation and obtain a technical disposition before acceptance. Operation alone does not prove that the system meets design intent. The other choices miss evidence-based acceptance. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.

130. D — D — After the test and restoration procedure identifies them for removal. Temporary items can change the operating configuration and must be controlled. The other choices miss restoring the intended line-up. Use the current drawing or procedure, perform the approved step, and verify the result. Record the final condition before restoring the system.