

Practice Test 7

Core Examination

Instructions: Select the best answer for each question. You have 90 minutes to complete this section.

1. What type of soil provides the most reliable bearing capacity?
 - A. Well-graded gravel with minimal moisture
 - B. Organic soil
 - C. Loose sand
 - D. Saturated clay

2. When must crane setup locations be inspected?
 - A. Monthly
 - B. Annually
 - C. Before operations at each new location
 - D. Inspections not required

3. What is the primary consideration when positioning cranes near excavations?
 - A. Excavation depth only
 - B. Soil failure zones extending beyond excavation
 - C. Excavation width only
 - D. Time since excavation

4. When operating on asphalt surfaces, what must be verified?
 - A. Pavement can support anticipated loads
 - B. Asphalt color
 - C. Asphalt age
 - D. Surface temperature only

5. What determines minimum mat thickness for crane operations?
 - A. Mat color
 - B. Mat age
 - C. Load distribution requirements and ground conditions
 - D. Mats not required

6. During operations, when must crane setup be reassessed?
 - A. Hourly
 - B. If conditions change or settlement occurs
 - C. Daily only

D. Weekly

7. What is required when working near power lines under 50 kilovolts?

- A. Minimum 10-foot clearance or de-energization
- B. No clearance required
- C. Operate at night only
- D. Special permits only

8. When planning lifts, what must be determined first?

- A. Weather forecast
- B. Fuel requirements
- C. Operator schedule
- D. Load weight and dimensions

9. What must be considered when selecting boom length?

- A. Boom color
- B. Required radius and lift height
- C. Time of day
- D. Fuel level

10. When must traffic control be established?

- A. Never required
- B. Only at night
- C. Monthly
- D. When operations affect traffic flow

11. What is required before lifting near property boundaries?

- A. Verification swing and fall zones remain within property
- B. Verbal notification only
- C. Higher insurance
- D. Night operations only

12. During high-consequence lifts, what planning is essential?

- A. Verbal agreement only
- B. Insurance notification
- C. Detailed written procedures
- D. No special planning required

13. When must load weights be verified?

- A. Monthly

- B. When weight is unknown or uncertain
- C. Weekly
- D. Weight verification optional

14. What determines crane travel route suitability?

- A. Shortest distance
- B. Fastest route
- C. Lowest cost
- D. Surface strength, clearances, and permits

15. When lifting in congested areas, what is essential?

- A. Coordination and communication protocols
- B. Operate at night
- C. Higher capacity crane
- D. Congested operations prohibited

16. What must be established around crane operations?

- A. Parking areas
- B. Break rooms
- C. Exclusion zones and barricades
- D. Office space

17. When operating near railroads, what is required?

- A. Visual inspection only
- B. Verbal notification
- C. Higher insurance
- D. Railroad notification and coordination

18. What determines if environmental conditions permit operations?

- A. Manufacturer limits and safety assessment
- B. Operator preference
- C. Project schedule
- D. Customer request

19. When must crane operations cease for precipitation?

- A. Any rain
- B. Never cease for rain
- C. Monthly
- D. When visibility or equipment function compromised

20. What is required for night crane operations?
- A. Special certification
 - B. Reduced capacity
 - C. Adequate lighting of work areas
 - D. Night operations prohibited
21. When operating multiple cranes, what must be coordinated?
- A. Crane colors
 - B. Swing paths and communication
 - C. Fuel levels
 - D. Insurance policies
22. What must be done if site conditions differ from planning assumptions?
- A. Continue as planned
 - B. Increase capacity
 - C. Document only
 - D. Revise plans or stop operations
23. When lifting loads over water, what is required?
- A. Special rigging and recovery procedures
 - B. Standard procedures apply
 - C. Operations prohibited
 - D. Verbal agreement only
24. What determines maximum allowable wind speed for operations?
- A. Operator comfort
 - B. Project schedule
 - C. General guidelines
 - D. Manufacturer specifications
25. When must emergency procedures be established?
- A. Before operations in hazardous areas
 - B. Monthly
 - C. Annually
 - D. Emergency procedures optional
26. What must be verified about counterweight?
- A. Counterweight color
 - B. Counterweight age
 - C. Correct amount per load charts

D. Counterweight manufacturer

27. When operating near airports, what may be required?

- A. Height restrictions and FAA notification
- B. Night operations only
- C. Special crane color
- D. Airport operations unrestricted

28. What determines if additional rigging is needed?

- A. Rigger preference
- B. Rigging color
- C. Time available
- D. Load configuration and weight

29. When must pre-lift meetings be conducted?

- A. Never required
- B. Monthly
- C. Before critical or complex operations
- D. Annually

30. What is required when boom must pass over occupied structures?

- A. Verbal warning
- B. Evacuation or boom blockage
- C. Higher insurance
- D. No restrictions

31. What is the standard hand signal for "travel"?

- A. Both arms extended in direction of travel
- B. One arm raised
- C. Circular motion
- D. Arms at sides

32. When using radio communication, what must be avoided?

- A. Technical terms
- B. Complete sentences
- C. Specific directions
- D. Unclear or ambiguous language

33. What must signal persons do if unable to see operations clearly?

- A. Continue signaling

- B. Signal faster
- C. Use additional signal person or stop
- D. Estimate positions

34. When must hand signals be demonstrated?

- A. Never required
- B. Before using non-standard signals
- C. Monthly
- D. Annually

35. What is the standard hand signal for "extend boom"?

- A. Arms overhead
- B. Circular motion
- C. One arm pointing
- D. Both fists pushing forward

36. During poor visibility, what is required for signaling?

- A. Louder voice
- B. No signaling possible
- C. Illuminated or enhanced signals
- D. Standard signals only

37. When can signal persons be changed during operations?

- A. Never during operations
- B. Anytime
- C. When relief is needed and new person positioned
- D. End of shift only

38. What takes precedence during multiple signals?

- A. Radio signals
- B. Stop signal from any source
- C. Hand signals
- D. Verbal signals

39. When must signal persons be qualified?

- A. Before giving any signals
- B. Within first week
- C. Within first month
- D. Qualification optional

40. What is required if signal person loses contact with operator?
- A. Continue current position
 - B. Signal louder
 - C. Move closer
 - D. Stop operations or use relay
41. During extended operations, when should signal persons be relieved?
- A. Every hour
 - B. Never during shift
 - C. When fatigued or ineffective
 - D. End of day only
42. What must operators do before executing signals?
- A. Wait 10 seconds
 - B. Confirm understanding
 - C. Check fuel level
 - D. Verify weather
43. When using voice communication, what must be established?
- A. Volume levels
 - B. Speaking speed
 - C. Confirmation protocols
 - D. Frequency only
44. What makes signal persons visible?
- A. Position only
 - B. High-visibility clothing
 - C. Lighting only
 - D. Hand movements only
45. When must backup communication methods be available?
- A. Never needed
 - B. When using radio as primary
 - C. Only for large cranes
 - D. Backup methods prohibited
46. Under OSHA, what must be done before crane operations?
- A. Hazard assessment
 - B. Insurance verification
 - C. Fuel check

D. Weather check only

47. What does OSHA require for operator qualification?

- A. Experience only
- B. Age requirement only
- C. No requirements
- D. Certification and employer evaluation

48. According to OSHA, when must shift inspections occur?

- A. Before each shift in use
- B. Weekly
- C. Monthly
- D. Inspections optional

49. What must employers verify per OSHA?

- A. Operator salary
- B. Union status
- C. Transportation
- D. Current valid certification

50. Under OSHA, who supervises crane assembly?

- A. Any worker
- B. Equipment owner
- C. Qualified A/D director
- D. Insurance agent

51. What does OSHA require for load chart accessibility?

- A. Charts can be stored off-site
- B. Charts must be accessible to operators
- C. Verbal capacity adequate
- D. Charts optional

52. According to OSHA, when is fall protection required?

- A. Never on cranes
- B. Only above 10 feet
- C. Fall protection optional
- D. Above 6 feet during A/D

53. What must OSHA inspections document?

- A. Date, findings, and corrective actions

- B. Operator names only
- C. Weather only
- D. Fuel consumption

54. Under OSHA, who authorizes modifications?

- A. Operator
- B. Owner only
- C. Manufacturer or qualified engineer
- D. Any supervisor

55. What does OSHA require for deficiencies?

- A. Document only
- B. Correct or remove from service
- C. Continue with caution
- D. Ignore if minor

56. According to OSHA, when must operators be re-evaluated?

- A. Every three years or when deficiencies occur
- B. Monthly
- C. Every 10 years
- D. Never

57. What must OSHA inspections evaluate?

- A. Paint only
- B. Safety-critical components
- C. Age only
- D. Fuel system only

58. Under OSHA, what is required near power lines?

- A. No requirements
- B. Verbal notification
- C. Higher insurance
- D. Clearances or de-energization

59. What does OSHA require for load charts?

- A. Current and accessible
- B. Optional
- C. Verbal adequate
- D. Not required

60. According to OSHA, when can trainees operate?
- A. In emergencies
 - B. With 30 days experience
 - C. With certified operator present
 - D. Never
61. Under ASME B30.5, what is rated capacity?
- A. Any load lifted
 - B. Maximum load per manufacturer
 - C. Load plus 50 percent
 - D. Operator estimate
62. What does ASME B30.5 require for rope inspection?
- A. Weekly
 - B. Monthly
 - C. Annually
 - D. Each shift in regular use
63. According to ASME B30.5, when must cranes be removed from service?
- A. Monthly
 - B. When unsafe conditions exist
 - C. Quarterly
 - D. Annually
64. What does ASME B30.5 require for modifications?
- A. Verbal approval
 - B. Owner approval
 - C. Manufacturer or engineer approval
 - D. No approval needed
65. Under ASME B30.5, what is required for personnel platforms?
- A. Standard procedures
 - B. Verbal agreement
 - C. Personnel platforms prohibited
 - D. Special requirements per B30.23
66. What does ASME B30.5 specify about operating limits?
- A. Follow manufacturer limitations
 - B. No limits
 - C. Operator discretion

D. Unlimited operations

67. According to ASME B30.5, when must indicators function?

- A. Monthly
- B. Annually
- C. Before operations
- D. Indicators optional

68. What does ASME B30.5 require for records?

- A. Verbal reports
- B. Written documentation
- C. No records
- D. Records prohibited

69. Under ASME B30.5, what defines critical lifts?

- A. Complexity, risk, or consequences
- B. Weight only
- C. Time of day
- D. Crane age

70. What does ASME B30.5 require about side loading?

- A. Side loading permitted
- B. Shall be avoided
- C. Increases capacity
- D. No restrictions

71. According to ASME B30.5, when is load testing required?

- A. Weekly
- B. Monthly
- C. After installation and modifications
- D. Testing not required

72. What does ASME B30.5 specify about suspended loads?

- A. Shall not be left unattended
- B. Acceptable for breaks
- C. No restrictions
- D. Can be left overnight

73. Under ASME B30.5, what must operators do if uncertain?

- A. Continue slowly

- B. Document concerns
- C. Consult coworkers
- D. Stop and obtain direction

74. What does ASME B30.5 require for rope replacement?

- A. Monthly
- B. Based on deterioration criteria
- C. Annually
- D. Never replaced

75. According to ASME B30.5, who authorizes return to service?

- A. Qualified person
- B. Operator
- C. Owner only
- D. Any mechanic

76. When reading load charts, what is needed first?

- A. Previous lifts
- B. Operator name
- C. Fuel level
- D. Current configuration

77. On load charts, radius represents what?

- A. Vertical distance
- B. Diagonal measurement
- C. Horizontal distance from center of rotation
- D. Boom length

78. What happens as radius increases?

- A. Capacity increases
- B. Capacity decreases
- C. No change
- D. Capacity doubles

79. When using attachments, what applies?

- A. Main boom charts
- B. No charts needed
- C. Estimate capacity
- D. Separate charts or deductions

80. What must be deducted for net capacity?
- A. Rigging and hook block weight
 - B. Fuel weight
 - C. Counterweight
 - D. Operator weight
81. On load charts, what do special markings indicate?
- A. Notes or conditions
 - B. Highest capacity
 - C. Lowest capacity
 - D. Recommended capacity
82. When boom angle changes, what happens?
- A. Nothing
 - B. Only height changes
 - C. Radius and capacity change
 - D. Only speed changes
83. What capacity is used between values?
- A. Higher capacity
 - B. Average values
 - C. Estimate
 - D. Lower capacity or interpolate
84. How are telescopic charts organized?
- A. Randomly
 - B. Alphabetically
 - C. By boom length and radii
 - D. By crane age
85. What indicates capacity limits on charts?
- A. Notes or bold numbers
 - B. Color
 - C. Page number
 - D. Font size
86. When counterweight changes, what is needed?
- A. Insurance update
 - B. Counterweight color check
 - C. No action

D. Correct chart section

87. What must be considered for large loads?

- A. Load color
- B. Wind effects on stability
- C. Load age
- D. Load manufacturer

88. What do footnotes contain?

- A. Crane history
- B. Operator names
- C. Restrictions and conditions
- D. Maintenance schedules

89. When using different configurations, what is essential?

- A. Reference correct chart each time
- B. Use first chart for all
- C. Estimate capacity
- D. Charts not needed

90. What affects capacity for unusual loads?

- A. Color
- B. Age
- C. Manufacturer
- D. Dimensions and center of gravity

91. What provides crane hydraulic power?

- A. Electric motor
- B. Manual pump
- C. Engine-driven pump
- D. Gravity

92. What indicates hydraulic problems?

- A. Normal operation
- B. Slow function or leaks
- C. Proper temperature
- D. Clean fluid

93. What is the hydraulic filter purpose?

- A. Increase pressure

- B. Cool fluid
- C. Remove contaminants
- D. Add lubrication

94. What causes hydraulic overheating?

- A. Proper operation
- B. Excessive load or poor cooling
- C. Clean filters
- D. Low hours

95. What do relief valves control?

- A. Flow direction
- B. Fluid level
- C. Temperature
- D. Maximum pressure

Specialty Examination

Instructions: Select the best answer for each question. You have 60 minutes to complete this section.

1. What is a primary advantage of crawler cranes?

- A. Excellent stability from wide track base
- B. High road speed
- C. Compact storage
- D. Low initial cost

2. On telescopic cranes, what synchronizes boom extension?

- A. Manual controls
- B. Gravity
- C. Operator coordination
- D. Hydraulic flow control and sensors

3. What provides lattice booms with high strength-to-weight ratio?

- A. Solid construction
- B. Triangulated framework design
- C. Heavy materials
- D. Compact design

4. On all-terrain cranes, what provides off-road capability?

- A. All-wheel drive and suspension systems
 - B. Single axle only
 - C. Manual transmission
 - D. Fixed differential
5. How do lattice cranes achieve extreme heights?
- A. Telescoping sections
 - B. Hydraulic extension
 - C. Modular boom sections
 - D. Fixed length design
6. On telescopic cranes, what prevents boom retraction?
- A. Manual locks only
 - B. Friction
 - C. Gravity
 - D. Hydraulic holding valves and mechanical locks
7. What advantage do fixed cabs provide?
- A. Better visibility
 - B. Lower maintenance requirements
 - C. Higher capacity
 - D. Improved operator comfort
8. When installing lattice boom sections, what ensures integrity?
- A. Speed of installation
 - B. Operator experience
 - C. Proper pins and manufacturer sequence
 - D. Section color matching
9. What is the function of boom pendants?
- A. Extend boom length
 - B. Support boom at various angles
 - C. Store rigging
 - D. Increase capacity
10. On all-terrain cranes, what coordinates axle steering?
- A. Manual linkages
 - B. Electronic or hydraulic control systems
 - C. Separate operators
 - D. Mechanical cables

11. What benefit do luffing jibs provide?
- A. Higher capacity
 - B. Lower cost
 - C. Variable radius without boom movement
 - D. Simpler operation
12. When reading offset jib charts, what additional factor matters?
- A. Time of day
 - B. Wind speed only
 - C. Operator experience
 - D. Offset angle
13. What limits maximum boom length?
- A. Structural capacity and stability
 - B. Operator preference
 - C. Boom color
 - D. Fuel capacity
14. What provides rough-terrain crane maneuverability?
- A. Long wheelbase
 - B. Tight turning radius and crab steering
 - C. Multiple axles
 - D. Fixed suspension
15. What controls lattice boom angle?
- A. Hydraulic cylinders only
 - B. Manual cranks
 - C. Counterweight position
 - D. Boom hoist through mast
16. How do fly jib capacities compare to main boom?
- A. Significantly reduced
 - B. No change
 - C. Slightly increased
 - D. Capacity doubles
17. What determines safe jib length?
- A. Jib color
 - B. Operator experience

- C. Ground conditions
- D. Manufacturer specifications

18. What does wider crawler track spacing provide?

- A. Faster travel
- B. Lower fuel use
- C. Increased stability and capacity
- D. Reduced maintenance

19. What is the telescopic crane setup advantage?

- A. Rapid deployment without assembly
- B. Higher capacity
- C. Longer boom
- D. Lower cost

20. When using boom extensions, what must be verified?

- A. Extension color
- B. Proper installation and load chart
- C. Extension age
- D. Extension weight only

21. Which hoist provides faster speeds?

- A. Main hoist only
- B. Manual hoist
- C. All equal
- D. Auxiliary hoist

22. What provides hydraulic crane swing control?

- A. Manual rotation
- B. Wire rope
- C. Hydraulic motor with proportional control
- D. Electric motor only

23. When changing track configuration, what is critical?

- A. Track color
- B. Use appropriate capacity chart
- C. Notify insurance
- D. Track width doesn't matter

24. When operating with boom inserts, what is essential?

- A. Correct installation and chart section
- B. Insert color
- C. Insert age
- D. Insert manufacturer

25. What guides telescopic boom sections?

- A. External tracks
- B. Operator vision
- C. Internal wear pads and guide systems
- D. Gravity

26. On lattice booms, which members carry primary loads?

- A. Lacing members
- B. Battens
- C. Bolts
- D. Main chord members

Practical Examination

Instructions: Select the best answer for each question. This section evaluates your understanding of hands-on operating procedures and inspection requirements.

1. When inspecting wire rope, what diameter reduction requires removal?

- A. 5 percent
- B. 7 percent or more from nominal
- C. 10 percent
- D. Diameter reduction not a factor

2. What is the proper method for checking rope lubrication?

- A. Visually and by feel for adequate lubrication
- B. Measurement only
- C. Color inspection
- D. Weight measurement

3. During pre-operational checks, what fluid condition is acceptable?

- A. Milky appearance
- B. Contaminated fluid
- C. Clean fluid at proper level
- D. Low fluid level

4. When inspecting hooks, what throat opening increase requires removal?
 - A. 5 percent
 - B. 10 percent
 - C. 12 percent
 - D. 15 percent or manufacturer limit

5. What indicates proper LMI function?
 - A. Display has power
 - B. Accurate response to boom and load changes
 - C. Display illuminated
 - D. Alarm sounds

6. During swing brake testing, what indicates malfunction?
 - A. Immediate stop
 - B. Holds position
 - C. Continued drift after control release
 - D. Smooth deceleration

7. What procedure verifies hoist brake function?
 - A. Visual inspection
 - B. Listen for sounds
 - C. Check fluid level
 - D. Load test with hold verification

8. What is verified before engine start?
 - A. All controls in neutral
 - B. Horn tested
 - C. Boom extended
 - D. Radio on

9. During warm-up, what temperature is monitored?
 - A. Ambient air
 - B. Fuel temperature
 - C. Engine coolant and hydraulic oil
 - D. Cab temperature

10. When deploying outriggers, what is continuously checked?
 - A. Deployment speed
 - B. Crane level during extension

- C. Hydraulic pressure only
- D. Fuel consumption

11. What is the proper hoist test?

- A. Maximum speed only
- B. Variable speeds and brake function
- C. Minimum speed only
- D. Visual inspection adequate

12. During control testing, what is acceptable?

- A. Delayed response
- B. Binding movement
- C. Smooth proportional response
- D. Erratic function

13. When checking length indicators, what is verified?

- A. Indicator color
- B. Indicator location
- C. Indicator age
- D. Accurate current length display

14. What rope condition requires immediate replacement?

- A. Proper flexibility
- B. Adequate lubrication
- C. Correct diameter
- D. Severe corrosion or kinking

15. During hydraulic inspection, what appearance is normal?

- A. Clear fluid at proper level
- B. Milky fluid
- C. Cloudy fluid
- D. Foamy fluid

16. When testing anti-two-block, what is proper function?

- A. Device visible
- B. Device labeled
- C. Warnings and cutout activation
- D. Device makes noise

17. What is the proper lock verification method?

- A. Visual only
- B. Verify engagement and attempt movement
- C. Paint condition
- D. Listen for sounds

18. During structural inspection, what requires attention?

- A. Cracks or permanent deformation
- B. Normal surface wear
- C. Proper labels
- D. Paint condition

19. When inspecting terminations, what is critical?

- A. Termination color
- B. Termination weight
- C. Termination age
- D. No loosening or damage

20. What must LMI displays provide?

- A. Display color
- B. Display size
- C. Functional readable information
- D. Display age

21. During rope inspection, what seating is required?

- A. Proper seating in all sheave grooves
- B. Rope can ride on flanges
- C. Seating not critical
- D. Visual check adequate

22. When checking hydraulic hoses, what requires replacement?

- A. Hoses flexible
- B. Hoses labeled
- C. Hoses have fittings
- D. Cracking, bulging, or deterioration

23. What is proper shutdown procedure?

- A. Lower boom, secure controls, document issues
- B. Leave running
- C. Secure controls only
- D. Lower boom only

24. During swing testing, what is proper operation?
- A. Continuous rotation
 - B. Jerky movement
 - C. Smooth operation with immediate brake
 - D. Delayed response
25. When inspecting extinguishers, what requires attention?
- A. Extinguisher mounted
 - B. Low pressure or expired inspection
 - C. Extinguisher visible
 - D. Extinguisher labeled
26. What must be verified about pins?
- A. Pin color
 - B. Full insertion with retention devices
 - C. Pin age
 - D. Pin manufacturer
27. During final verification, what is confirmed?
- A. All systems functional and area clear
 - B. Crane painted
 - C. Crane expensive
 - D. Crane large
28. When inspecting pins, what indicates problems?
- A. Proper paint
 - B. Correct labels
 - C. Wear, cracks, or elongated holes
 - D. Original installation
29. What indicates proper hydraulic cylinder function?
- A. Smooth operation without leaks
 - B. Cylinders visible
 - C. Cylinders painted
 - D. Cylinders labeled
30. During high-wind shutdown, what is proper positioning?
- A. Maximum height
 - B. Horizontal position

- C. Fully extended
- D. Per manufacturer wind specifications

Answers & Explanations - Practice Test 7

Core Examination

1. Correct Answer: A (Well-graded gravel with minimal moisture)

Well-graded gravel with minimal moisture provides the most reliable bearing capacity for crane operations. Well-graded gravel typically supports 3,000 to 8,000 pounds per square foot depending on compaction and gradation. The combination of various particle sizes creates excellent load distribution with minimal settlement. Low moisture content prevents strength reduction from saturation effects.

2. Correct Answer: C (Before operations at each new location)

Crane setup locations must be inspected before operations at each new location. Each site presents unique ground conditions, hazards, and requirements. This inspection verifies that ground conditions are adequate, level is within specifications, and no hazards exist that could compromise safe operations.

3. Correct Answer: B (Soil failure zones extending beyond excavation)

The primary consideration when positioning cranes near excavations is soil failure zones extending beyond excavation edges. Excavations create zones of reduced soil strength that extend laterally beyond excavation faces. If crane support falls within these weakened zones, ground failure can occur causing crane tipping.

4. Correct Answer: A (Pavement can support anticipated loads)

When operating on asphalt surfaces, it must be verified that pavement thickness and condition can support anticipated loads from crane weight and outrigger reactions. Asphalt strength varies with thickness, base conditions, and temperature. Inadequate pavement can fail under concentrated outrigger loads.

5. Correct Answer: C (Load distribution requirements and ground conditions)

Minimum mat thickness is determined by load distribution requirements spreading outrigger forces over sufficient area and ground conditions affecting bearing capacity. Higher loads or weaker soils require thicker mats to distribute loads adequately preventing excessive bearing pressure.

6. Correct Answer: B (If conditions change or settlement occurs)

During operations, crane setup must be reassessed if conditions change such as weather affecting ground or if settlement occurs. Ground changes can alter crane level compromising stability. Continuous monitoring identifies developing problems allowing correction before conditions become unsafe.

7. Correct Answer: A (Minimum 10-foot clearance or de-energization)

When working near power lines under 50 kilovolts, OSHA requires minimum 10-foot clearance or de-energization by the utility company. This clearance prevents electrocution from electrical arcing. Lines must be de-energized if adequate clearance cannot be maintained.

8. Correct Answer: D (Load weight and dimensions)

When planning lifts, load weight and dimensions must be determined first. These fundamental parameters establish what crane capacity is required, what rigging is needed, and whether planned crane position provides adequate capacity. All other planning depends on accurate load information.

9. Correct Answer: B (Required radius and lift height)

When selecting boom length, required operating radius and lift height must be considered. Longer booms are needed to reach distant loads or achieve greater heights. The relationship between boom length, angle, and resulting radius and height determines required boom length.

10. Correct Answer: D (When operations affect traffic flow)

Traffic control must be established when operations affect traffic flow including boom swing through traffic lanes, load placement blocking roads, or crane positioning obstructing traffic. Traffic control prevents vehicles from entering hazardous areas and maintains orderly flow.

11. Correct Answer: A (Verification swing and fall zones remain within property)

Before lifting near property boundaries, it must be verified that swing radius and potential fall zones remain within property limits. Loads or boom swinging over adjacent property without permission creates liability and safety concerns. All operations must remain within authorized areas.

12. Correct Answer: C (Detailed written procedures)

During high-consequence lifts where failure would result in significant injury, death, or property damage, detailed written procedures are essential. These procedures document all aspects including equipment configuration, rigging, personnel responsibilities, and emergency measures ensuring thorough planning.

13. Correct Answer: B (When weight is unknown or uncertain)

Load weights must be verified when weight is unknown or uncertain. Operating with inaccurate weight information creates serious overload risks. Weight verification through documentation, calculation, or weighing ensures accurate capacity determination.

14. Correct Answer: D (Surface strength, clearances, and permits)

Crane travel route suitability is determined by surface strength to support crane weight during travel, clearances including overhead and lateral obstructions, and permits or authorizations required. Routes must be evaluated comprehensively ensuring safe passage.

15. Correct Answer: A (Coordination and communication protocols)

When lifting in congested areas, coordination and communication protocols are essential. These protocols define how crane operators, signal persons, riggers, and other workers communicate and coordinate movements. Clear protocols prevent confusion and conflicts in busy environments.

16. Correct Answer: C (Exclusion zones and barricades)

Exclusion zones preventing unauthorized personnel access to hazardous areas and barricades physically blocking access must be established around crane operations. These measures prevent injuries from load drops, boom contact, or other hazards within operating radii.

17. Correct Answer: D (Railroad notification and coordination)

When operating near railroads, railroad notification and coordination are required. Railroads must be aware of crane presence, and procedures must ensure cranes do not extend into railroad clearance zones when trains pass. Coordination prevents boom or load contact with trains.

18. Correct Answer: A (Manufacturer limits and safety assessment)

Whether environmental conditions permit operations is determined by manufacturer limits for wind, temperature, or other conditions and safety assessment of actual site conditions. Operations must remain within equipment limitations while ensuring worker safety.

19. Correct Answer: D (When visibility or equipment function compromised)

Crane operations must cease for precipitation when visibility is compromised preventing safe operations or when equipment function is affected through ice accumulation, electrical problems, or reduced braking effectiveness. Safety must not be compromised by weather.

20. Correct Answer: C (Adequate lighting of work areas)

Night crane operations require adequate lighting of work areas including the crane, loads, landing areas, and personnel positions. Lighting must allow clear visibility of operations, load positions, hazards, and hand signals preventing accidents from reduced visibility.

21. Correct Answer: B (Swing paths and communication)

When operating multiple cranes, swing paths and communication must be coordinated. This requires coordination of swing radii, lift paths, and timing ensuring cranes do not interfere. Clear communication between operators prevents boom or load collisions.

22. Correct Answer: D (Revise plans or stop operations)

If site conditions differ from planning assumptions including ground conditions, clearances, or load characteristics, plans must be revised to address actual conditions or operations must stop. Operating based on incorrect assumptions creates serious accident risks.

23. Correct Answer: A (Special rigging and recovery procedures)

When lifting loads over water, special rigging accounting for potential water immersion and recovery procedures establishing how loads will be recovered if dropped are required. These preparations address unique hazards of overwater operations.

24. Correct Answer: D (Manufacturer specifications)

Maximum allowable wind speed for operations is determined by manufacturer specifications based on crane design and stability characteristics. Manufacturers establish maximum wind speeds through analysis ensuring adequate stability margins under wind loading.

25. Correct Answer: A (Before operations in hazardous areas)

Emergency procedures must be established before operations in hazardous areas such as proximity to power lines, hazardous materials, or unstable structures. These procedures ensure personnel understand evacuation routes, emergency contacts, and response procedures.

26. Correct Answer: C (Correct amount per load charts)

Regarding counterweight, the correct amount per load chart requirements for planned operations must be verified. Load charts show capacities for specific counterweight configurations. Physical verification ensures counterweight matches chart requirements preventing overload or stability risks.

27. Correct Answer: A (Height restrictions and FAA notification)

When operating near airports, height restrictions under FAA regulations and notification to airport authorities may be required. Cranes can interfere with flight paths requiring coordination. Cranes exceeding certain heights may require lighting or painting.

28. Correct Answer: D (Load configuration and weight)

Whether additional rigging is needed is determined by load configuration including attachment points and balance requirements, and load weight requiring adequate capacity. Complex or heavy loads may need additional slings, spreader bars, or specialized rigging.

29. Correct Answer: C (Before critical or complex operations)

Pre-lift meetings must be conducted before critical or complex operations requiring coordination or special procedures. These meetings review procedures, hazards, assignments, and communication methods ensuring all personnel understand their roles.

30. Correct Answer: B (Evacuation or boom blockage)

When boom must pass over occupied structures, OSHA requires building evacuation removing personnel from under the boom path, or physical boom blockage preventing passage over occupied structures. This prevents injuries from dropped loads or boom failure.

31. Correct Answer: A (Both arms extended in direction of travel)

The standard hand signal for "travel" consists of both arms extended pointing in the direction of desired travel. This directional signal clearly indicates which direction the crane should travel, providing an intuitive visual cue.

32. Correct Answer: D (Unclear or ambiguous language)

When using radio communication, unclear or ambiguous language must be avoided. All communications should use clear, specific terminology that cannot be misinterpreted. Standard terms for directions and functions ensure instructions are understood correctly.

33. Correct Answer: C (Use additional signal person or stop)

If signal persons are unable to see operations clearly, an additional signal person positioned where operations are visible must be used or operations must stop. Someone with clear view must monitor operations ensuring safe handling.

34. Correct Answer: B (Before using non-standard signals)

Hand signals must be demonstrated before using non-standard signals. This demonstration ensures operators, signal persons, and supervisors understand signal meanings preventing misinterpretation. All personnel must agree before using modified signals.

35. Correct Answer: D (Both fists pushing forward)

The standard hand signal for "extend boom" consists of both fists positioned in front of the body with a pushing forward motion. This signal simulates pushing the boom sections outward, providing an intuitive visual representation.

36. Correct Answer: C (Illuminated or enhanced signals)

During poor visibility, illuminated or enhanced signals are required for signaling. This includes lighted wands, reflective clothing, or additional lighting allowing operators to clearly see signals despite darkness, fog, or dust.

37. Correct Answer: C (When relief is needed and new person positioned)

Signal persons can be changed during operations when relief is needed and the new person is properly positioned with clear view of operations. The change must be coordinated ensuring operators know where to look for signals.

38. Correct Answer: B (Stop signal from any source)

During multiple signals, the stop signal from any source takes precedence. When stop is given by any person for any reason, operators must stop immediately. This absolute priority ensures immediate response to safety concerns.

39. Correct Answer: A (Before giving any signals)

Signal persons must be qualified before giving any signals. Qualification ensures individuals have knowledge of standard signals and crane operations, and ability to effectively perform duties. Operating without qualified signal persons creates serious accident risks.

40. Correct Answer: D (Stop operations or use relay)

If signal person loses contact with operator, operations must stop or a relay signal person maintaining the communication chain must be used. Visual contact between operator and signal person is essential for effective communication.

41. Correct Answer: C (When fatigued or ineffective)

During extended operations, signal persons should be relieved when they become fatigued reducing attention and reaction time, or when unable to perform effectively. Effective signaling requires full attention and clear communication ability.

42. Correct Answer: B (Confirm understanding)

Operators must confirm understanding before executing signals. This confirmation through repeat-back or acknowledgment ensures signals were received and understood correctly. The communication loop must be complete before potentially hazardous movements.

43. Correct Answer: C (Confirmation protocols)

When using voice communication, confirmation protocols requiring acknowledgment and repeat-back must be established. These protocols ensure communications are understood correctly preventing misinterpretations during crane operations.

44. Correct Answer: B (High-visibility clothing)

High-visibility clothing makes signal persons visible ensuring operators can clearly see them against backgrounds and in varying lighting conditions. High-visibility apparel makes signal persons readily identifiable in busy work environments.

45. Correct Answer: B (When using radio as primary)

Backup communication methods must be available when using radio as primary communication. Radio systems can fail from equipment malfunction, interference, or dead batteries. Predetermined hand signals provide backup ensuring communication can continue.

46. Correct Answer: A (Hazard assessment)

Under OSHA, hazard assessment must be done before crane operations. This assessment identifies site hazards including power lines and fall hazards, and ground conditions requiring special precautions. The assessment establishes foundation for safe operations.

47. Correct Answer: D (Certification and employer evaluation)

OSHA requires for operator qualification certification by accredited testing organizations and employer evaluation on specific equipment and site hazards. Both components ensure operators possess necessary knowledge and can safely operate.

48. Correct Answer: A (Before each shift in use)

According to OSHA, shift inspections must occur before each shift when cranes are in use. These inspections identify problems that developed since last use. Shift inspections ensure equipment is safe before operations begin.

49. Correct Answer: D (Current valid certification)

Employers must verify per OSHA that operators hold current valid certification for the type and capacity of equipment being operated. This verification ensures operators hold appropriate qualifications. Expired certifications do not meet requirements.

50. Correct Answer: C (Qualified A/D director)

Under OSHA, qualified assembly/disassembly director must supervise crane assembly. This individual has specific knowledge of assembly procedures and ensures manufacturer procedures are followed correctly verifying connection integrity.

51. Correct Answer: B (Charts must be accessible to operators)

OSHA requires that load charts must be accessible to operators during operations. Charts must be available for reference allowing operators to determine available capacity for planned lifts throughout operations.

52. Correct Answer: D (Above 6 feet during A/D)

According to OSHA, fall protection is required above 6 feet during assembly/disassembly operations. Personal fall arrest systems or guardrail systems protect workers from fall hazards during elevated A/D work.

53. Correct Answer: A (Date, findings, and corrective actions)

OSHA inspections must document inspection date, findings identifying defects or unsafe conditions, and corrective actions taken. This documentation provides accountability, history, and verification of compliance.

54. Correct Answer: C (Manufacturer or qualified engineer)

Under OSHA, manufacturer or qualified engineer must authorize modifications. Only these qualified parties can verify through analysis that modifications maintain adequate safety factors and do not adversely affect integrity.

55. Correct Answer: B (Correct or remove from service)

OSHA requires for deficiencies that they must be corrected before continued use or equipment must be removed from service. Operating with known defects violates safety requirements and creates serious hazards.

56. Correct Answer: A (Every three years or when deficiencies occur)

According to OSHA, operators must be re-evaluated every three years or when performance deficiencies are observed. This periodic re-evaluation ensures operators maintain competency and identifies skill deterioration.

57. Correct Answer: B (Safety-critical components)

OSHA inspections must evaluate safety-critical components including structural elements, mechanical systems, safety devices, and controls. These inspections identify defects affecting safe operations requiring correction.

58. Correct Answer: D (Clearances or de-energization)

Under OSHA near power lines, clearances meeting voltage-based requirements or de-energization procedures must be established. These measures prevent electrocution from electrical contact or arcing.

59. Correct Answer: A (Current and accessible)

OSHA requires regarding load charts that they must be current for equipment configuration and accessible to operators. Charts must match actual crane setup to provide accurate capacity information.

60. Correct Answer: C (With certified operator present)

According to OSHA, trainees can operate with certified operator present who is physically at controls. This allows hands-on training under expert supervision. The certified operator must be able to take control immediately.

61. Correct Answer: B (Maximum load per manufacturer)

Under ASME B30.5, rated capacity is the maximum load for which the crane is designed and built by the manufacturer for specific configurations. Rated capacities include appropriate safety factors.

62. Correct Answer: D (Each shift in regular use)

ASME B30.5 requires rope inspection each shift when equipment is in regular use. This frequent inspection allows operators to identify rope deterioration before defects progress to failure.

63. Correct Answer: B (When unsafe conditions exist)

According to ASME B30.5, cranes must be removed from service when unsafe conditions exist including malfunction, damage, or defects affecting safe operation. Equipment cannot return until conditions are corrected.

64. Correct Answer: C (Manufacturer or engineer approval)

ASME B30.5 requires for modifications that manufacturer or qualified engineer approval must be obtained. Only these parties can verify that modifications maintain adequate safety factors.

65. Correct Answer: D (Special requirements per B30.23)

Under ASME B30.5, personnel platforms require special requirements detailed in ASME B30.23. These requirements ensure personnel safety during high-risk hoisting operations.

66. Correct Answer: A (Follow manufacturer limitations)

ASME B30.5 specifies regarding operating limits that manufacturer limitations must be followed. Manufacturers establish limits based on crane design characteristics.

67. Correct Answer: C (Before operations)

According to ASME B30.5, indicators must function before operations for capacity determination. Operators rely on indicator information for accurate chart reading.

68. Correct Answer: B (Written documentation)

ASME B30.5 requires written documentation for records documenting inspections and repairs. These records provide equipment history and verify compliance.

69. Correct Answer: A (Complexity, risk, or consequences)

Under ASME B30.5, critical lifts are defined by complexity, risk factors, or potential consequences of failure requiring special planning and procedures.

70. Correct Answer: B (Shall be avoided)

ASME B30.5 requires that side loading shall be avoided. Side loading creates dangerous bending stresses in booms not designed for such loads.

71. Correct Answer: C (After installation and modifications)

According to ASME B30.5, load testing is required after installation and after modifications affecting capacity. Tests verify components can support rated loads.

72. Correct Answer: A (Shall not be left unattended)

ASME B30.5 specifies loads shall not be left suspended when cranes are unattended. Leaving loads suspended creates hazards from rigging failure or equipment malfunction.

73. Correct Answer: D (Stop and obtain direction)

Under ASME B30.5, if operators are uncertain, they must stop and obtain direction from qualified persons. Proceeding with uncertainty creates serious accident risks.

74. Correct Answer: B (Based on deterioration criteria)

ASME B30.5 requires rope replacement based on specific deterioration criteria including broken wires, diameter reduction, and other defined defects.

75. Correct Answer: A (Qualified person)

According to ASME B30.5, a qualified person must authorize return to service after repairs verifying equipment is safe for operations.

76. Correct Answer: D (Current configuration)

When reading load charts, current crane configuration including boom length, counterweight, and outrigger extension is needed first. Configuration determines which chart section applies.

77. Correct Answer: C (Horizontal distance from center of rotation)

On load charts, radius represents horizontal distance from center of rotation to vertical centerline of hoist line. This horizontal measurement determines capacity.

78. Correct Answer: B (Capacity decreases)

As radius increases, capacity decreases. Greater radius increases overturning moment reducing the load that stability can support.

79. Correct Answer: D (Separate charts or deductions)

When using attachments, separate charts or deductions are required. Attachments significantly alter capacity compared to main boom alone.

80. Correct Answer: A (Rigging and hook block weight)

Rigging and hook block weight must be deducted for net capacity. Hook block and rigging consume capacity. Only remaining net capacity is available for loads.

81. Correct Answer: A (Notes or conditions)

On load charts, special markings indicate notes or conditions requiring operator attention. These markings identify special requirements, deductions, or restrictions.

82. Correct Answer: C (Radius and capacity change)

When boom angle changes, radius and capacity change. Raising boom angle decreases radius and generally increases capacity.

83. Correct Answer: D (Lower capacity or interpolate)

Between chart values, the lower capacity should be used or proportional interpolation performed. Using lower capacity ensures adequate safety margins.

84. Correct Answer: C (By boom length and radii)

Telescopic charts are organized by boom length sections showing capacities at various radii for each length.

85. Correct Answer: A (Notes or bold numbers)

Capacity limits on charts are indicated by notes or bold numbers showing structural versus stability limits.

86. Correct Answer: D (Correct chart section)

When counterweight changes, the correct chart section for that counterweight configuration must be used. Different amounts provide substantially different capacities.

87. Correct Answer: B (Wind effects on stability)

For large loads, wind effects on stability must be considered. Large surfaces create wind forces that add to overturning moments.

88. Correct Answer: C (Restrictions and conditions)

Footnotes contain restrictions and conditions that apply to operations including important limitations and requirements.

89. Correct Answer: A (Reference correct chart each time)

When using different configurations, it is essential to reference the correct chart for each configuration preventing serious overload risks.

90. Correct Answer: D (Dimensions and center of gravity)

For unusual loads, dimensions and center of gravity affect capacity. Loads with offset centers or extreme dimensions may require capacity reductions.

91. Correct Answer: C (Engine-driven pump)

Engine-driven pump provides crane hydraulic power. The pump draws fluid from reservoir and pressurizes it creating flow that drives cylinders and motors.

92. Correct Answer: B (Slow function or leaks)

Slow function or leaks indicate hydraulic problems. Slow function suggests inadequate pressure or flow while leaks show seal failure.

93. Correct Answer: C (Remove contaminants)

Hydraulic filter purpose is removing contaminants from fluid protecting components from wear. Filters capture particles maintaining fluid cleanliness.

94. Correct Answer: B (Excessive load or poor cooling)

Excessive load or poor cooling causes hydraulic overheating. Overheating damages seals, degrades fluid, and reduces efficiency.

95. Correct Answer: D (Maximum pressure)

Relief valves control maximum pressure. Relief valves open when pressure exceeds settings preventing damage from excessive pressure.

Specialty Examination

1. Correct Answer: A (Excellent stability from wide track base)

A primary advantage of crawler cranes is excellent stability provided by the wide track base. Crawler tracks distribute crane weight over large areas creating ground pressures as low as 5-15 psi, allowing operations on soils that would not support wheeled cranes. The wide track base provides exceptional stability for heavy lifting with superior resistance to tipping compared to wheeled configurations.

2. Correct Answer: D (Hydraulic flow control and sensors)

On telescopic cranes, boom extension is synchronized through hydraulic flow control systems and position sensors. These systems coordinate extension cylinders ensuring sections extend smoothly together rather than one section extending completely before others begin. Position sensors monitor section positions while flow control manages hydraulic distribution maintaining synchronization throughout the extension process.

3. Correct Answer: B (Triangulated framework design)

Lattice booms achieve high strength-to-weight ratio through triangulated framework design. The open lattice structure with diagonal lacing creates efficient load paths distributing forces through triangulated geometry. This design provides exceptional strength while minimizing weight, allowing lattice cranes to achieve greater heights and capacities compared to heavier telescopic designs.

4. Correct Answer: A (All-wheel drive and suspension systems)

On all-terrain cranes, all-wheel drive with power to multiple axles and advanced suspension systems provide off-road capability. These systems ensure power reaches wheels with grip even on uneven terrain while suspension adjusts to ground contours. This combination allows operation on unprepared surfaces where standard highway vehicles cannot function.

5. Correct Answer: C (Modular boom sections)

Lattice cranes achieve extreme heights through modular boom sections that can be assembled to required lengths. Sections connect with pins creating continuous boom structures. This modularity allows boom lengths exceeding 400 feet for some cranes, with configurations customized to specific job requirements by selecting appropriate section combinations and arrangements.

6. Correct Answer: D (Hydraulic holding valves and mechanical locks)

On telescopic cranes, hydraulic holding valves prevent boom retraction by maintaining pressure in extension cylinders preventing reverse flow. Mechanical locks provide additional security engaging when sections reach desired positions, ensuring positive retention independent of hydraulic pressure. These dual systems ensure controlled safe boom extension and retraction.

7. Correct Answer: B (Lower maintenance requirements)

Fixed cabs provide the advantage of lower maintenance requirements compared to swing cabs. Fixed cabs require no rotating connections for hydraulic lines, electrical systems, or controls that must function through continuous rotation. This simpler design reduces maintenance requirements and potential failure points while reducing initial cost.

8. Correct Answer: C (Proper pins and manufacturer sequence)

When installing lattice boom sections, structural integrity is ensured by proper pin installation through all connection holes with retention devices engaged, and following manufacturer assembly sequence exactly. Boom sections must be assembled in specific sequences ensuring proper load paths. Any deviation or incomplete connections can cause structural failure during operations.

9. Correct Answer: B (Support boom at various angles)

The function of boom pendants is supporting the boom at various angles from the mast structure. Pendants are wire ropes connecting boom tip to mast top, carrying compressive boom forces in tension. Adjusting pendant length through the boom hoist changes boom angle while pendants provide positive support preventing uncontrolled lowering.

10. Correct Answer: B (Electronic or hydraulic control systems)

On all-terrain cranes, electronic or hydraulic control systems coordinate axle steering. These sophisticated systems can steer axles simultaneously for tight turns or independently for different maneuvers. Advanced systems automatically coordinate axle steering angles based on vehicle speed, turn radius, and operator inputs optimizing maneuverability for various conditions.

11. Correct Answer: C (Variable radius without boom movement)

Luffing jibs provide the benefit of variable radius capability without requiring main boom movement. Luffing jibs can change angle independently through their own hoist system, allowing radius adjustment while maintaining constant hook height or adjusting both parameters. This versatility proves valuable for precision placement in confined areas or when working around obstructions.

12. Correct Answer: D (Offset angle)

When reading offset jib charts, the additional factor that matters is the offset angle from boom centerline. As jibs offset from straight ahead positions, capacity decreases due to altered loading patterns and increased structural stress. Charts show capacity values at various offset angles requiring operators to match actual offset to chart values for accurate capacity determination.

13. Correct Answer: A (Structural capacity and stability)

Maximum boom length is limited by structural capacity of boom members to support loads without failure and overall crane stability. Longer booms create greater overturning moments and impose higher structural loads on boom members. Manufacturers establish maximum lengths through engineering analysis ensuring adequate strength and stability margins across operating ranges.

14. Correct Answer: B (Tight turning radius and crab steering)

Rough-terrain crane maneuverability is provided by tight turning radius from short wheelbase and crab steering capability. Crab steering allows rear wheels to steer opposite the front wheels or in the same direction, enabling tight turns, sideways movement, or coordinated steering. This versatility allows operation in restricted areas where larger cranes cannot maneuver.

15. Correct Answer: D (Boom hoist through mast)

Lattice boom angle is controlled by the boom hoist system working through the mast. The boom hoist rope runs from the drum over sheaves at the mast top to the boom point. Adjusting rope length through the hoist raises or lowers boom angle while the mast provides the leverage point for angle changes.

16. Correct Answer: A (Significantly reduced)

Fly jib capacities are significantly reduced compared to main boom alone. Fly jibs add weight at the boom tip, extend the total boom length, and create additional structural loading. These factors combine to reduce capacity dramatically, often to 20-40 percent of main boom capacity at similar radii, requiring careful capacity planning.

17. Correct Answer: D (Manufacturer specifications)

Safe jib length is determined by manufacturer specifications based on structural analysis. Manufacturers establish maximum jib lengths through engineering analysis ensuring that combined boom and jib loading remains within structural capacity limits and that stability is maintained throughout the operating range for each specific configuration.

18. Correct Answer: C (Increased stability and capacity)

Wider crawler track spacing provides increased stability and capacity by increasing the base of support. Greater track spacing increases the moment arm for resisting overturning moments allowing higher lifting capacities. Wide-track configurations typically provide 15-30 percent greater capacity than narrow-track configurations for the same crane model.

19. Correct Answer: A (Rapid deployment without assembly)

The telescopic crane setup advantage is rapid deployment without boom assembly requirements. Telescopic cranes arrive with boom mounted and extend hydraulically in minutes, while lattice cranes require boom assembly taking hours or days. This speed advantage makes telescopic cranes ideal for projects requiring mobility and quick setup between multiple lift locations.

20. Correct Answer: B (Proper installation and load chart)

When using boom extensions, it must be verified that extensions are properly installed per manufacturer requirements and that the correct load chart section for extended configuration is being used. Extensions affect boom strength and capacity requiring specific chart sections. Improper installation or wrong charts create serious safety risks.

21. Correct Answer: D (Auxiliary hoist)

Auxiliary hoist provides faster line speeds than main hoists. Auxiliaries are designed for lighter loads using smaller ropes and drums allowing higher speeds. Line speeds may be 50-100 percent faster than

main hoists, making auxiliaries efficient for handling rigging, tools, or lighter materials while main hoists handle primary heavy loads.

22. Correct Answer: C (Hydraulic motor with proportional control)

Hydraulic crane swing control is provided by a hydraulic motor with proportional control responding to operator inputs. The motor drives the swing mechanism with speed proportional to control deflection. Smooth proportional control allows precise swing positioning while automatic braking stops and holds position when controls return to neutral.

23. Correct Answer: B (Use appropriate capacity chart)

When changing track configuration, it is critical to use the appropriate capacity chart for the track configuration. Wide-track and narrow-track configurations provide substantially different capacities requiring different chart sections. Using the wrong chart creates serious overload risks or unnecessarily restricts operations with available capacity.

24. Correct Answer: A (Correct installation and chart section)

When operating with boom inserts, correct installation per manufacturer requirements and use of the appropriate chart section is essential. Inserts affect boom structural characteristics and capacity. Proper installation ensuring all connections are complete and correct chart use ensure safe operations within actual equipment capabilities.

25. Correct Answer: C (Internal wear pads and guide systems)

Telescopic boom sections are guided during extension by internal wear pads and guide systems. Wear pads made of low-friction materials ride on machined surfaces inside boom sections allowing smooth extension while maintaining alignment. These guides prevent binding and ensure sections extend concentrically without jamming or misalignment.

26. Correct Answer: D (Main chord members)

On lattice booms, main chord members carry primary loads. These large angle or tube members running the length of the boom at its corners form the main load-carrying framework. Chords resist bending and compression forces from boom weight and loads while lacing members and battens provide lateral support maintaining chord spacing and overall structural geometry.

Practical Examination

1. **Correct Answer: B (7 percent or more from nominal)**

When inspecting wire rope, diameter reduction of 7 percent or more from nominal diameter requires removal. This reduction indicates loss of metallic area from broken wires, wear, or corrosion reducing rope strength. ASME B30.5 specifies this removal criterion ensuring ropes are replaced before strength deterioration becomes critical for safe operations.

2. **Correct Answer: A (Visually and by feel for adequate lubrication)**

The proper method for checking rope lubrication is visually inspecting for lubricant presence and checking by feel for adequate lubrication throughout the rope. Proper lubrication appears as visible coating with slight oil feel. Dry or rusty rope indicates inadequate lubrication requiring application to prevent internal corrosion and reduce friction wear.

3. **Correct Answer: C (Clean fluid at proper level)**

During pre-operational checks, clean fluid at proper level is the acceptable fluid condition. Hydraulic fluid should appear clear or amber depending on type, free from contamination, and maintained at proper reservoir level. Clean fluid at correct level indicates the system is ready for operations without contamination or low-level concerns.

4. **Correct Answer: D (15 percent or manufacturer limit)**

When inspecting hooks, throat opening increase of 15 percent beyond original dimension or manufacturer specified limit requires removal. Throat opening increase indicates permanent stretching from overloads compromising hook integrity. ASME B30.10 establishes this removal criterion ensuring hooks are replaced before failure risk becomes unacceptable.

5. **Correct Answer: B (Accurate response to boom and load changes)**

Proper LMI function is indicated by accurate response to boom and load changes with the display tracking actual crane configuration and loading. The system should respond immediately to boom angle changes, radius adjustments, and load additions showing current capacity utilization accurately. Systems providing accurate real-time information allow operators to monitor capacity effectively.

6. **Correct Answer: C (Continued drift after control release)**

During swing brake testing, continued drift after control release indicates malfunction. Properly functioning swing brakes engage automatically when controls return to neutral stopping rotation immediately and holding position without drift. Any continued movement or inability to hold position indicates brake adjustment or repair is needed before operations.

7. Correct Answer: D (Load test with hold verification)

The procedure verifying hoist brake function is performing a load test by raising a load or the unloaded hook, then releasing the control to neutral and verifying that the hoist immediately stops and holds position without drift or lowering. The automatic brake should engage instantly preventing any load movement demonstrating proper function under actual load conditions.

8. Correct Answer: A (All controls in neutral)

Before engine start, it is verified that all controls are in neutral positions. This verification prevents unintended crane movements when hydraulic systems pressurize after engine start. Operators should physically check each control lever ensuring neutral before attempting engine start preventing dangerous unexpected movements.

9. Correct Answer: C (Engine coolant and hydraulic oil)

During warm-up, engine coolant and hydraulic oil temperatures are monitored. Coolant temperature should show gradual warming toward operating range while hydraulic oil temperature increases from cold start. Both fluids must reach proper operating temperatures before placing systems under full load ensuring adequate lubrication and viscosity for component protection.

10. Correct Answer: B (Crane level during extension)

When deploying outriggers, crane level is continuously checked during extension. Real-time level monitoring allows immediate adjustment of individual jack heights on different corners achieving proper level as the crane lifts off its tires or tracks. Most manufacturers limit out-of-level to one percent grade requiring careful monitoring and adjustment during deployment.

11. Correct Answer: B (Variable speeds and brake function)

The proper hoist test is operating at variable speeds and testing brake function. Operators should verify that hoist responds smoothly to control inputs at slow and fast speeds, that controls return to neutral properly, that brakes engage automatically when controls are released, and that loads stop and hold without drift under various load conditions.

12. Correct Answer: C (Smooth proportional response)

During control testing, smooth proportional response is acceptable. Controls should respond smoothly and proportionally to operator inputs without delays, binding, jerking, or erratic behavior. Functions should accelerate and decelerate smoothly with movement proportional to control deflection, and brakes should engage automatically returning controls to neutral.

13. Correct Answer: D (Accurate current length display)

When checking length indicators, accurate current length display is verified. Indicators must accurately display actual boom length matching the extended length. These indicators are essential for capacity determination using load charts. Operators must know exact boom length to read capacities correctly. Inaccurate indicators create serious overload risks requiring calibration or repair.

14. Correct Answer: D (Severe corrosion or kinking)

Rope condition requiring immediate replacement is severe corrosion reducing rope diameter or creating pitting, or kinking showing permanent distortion. Severe corrosion indicates significant loss of metallic area and strength. Kinks create severe localized stress concentrations dramatically reducing rope strength. Either condition can cause sudden failure under loads requiring immediate rope removal.

15. Correct Answer: A (Clear fluid at proper level)

During hydraulic inspection, clear fluid at proper level is normal appearance. Hydraulic fluid should appear clear or amber depending on type, free from contamination, cloudiness, or discoloration, and maintained at proper reservoir level markings. This appearance indicates fluid is clean and system is properly serviced ready for operations.

16. Correct Answer: C (Warnings and cutout activation)

When testing anti-two-block, proper function is indicated by visual and audible warnings activating well before contact occurs and automatic hoist cutout preventing actual boom tip contact with the hook block. The device should provide adequate warning allowing operator response, then prevent two-blocking through automatic function cutout protecting equipment from damage.

17. Correct Answer: B (Verify engagement and attempt movement)

The proper lock verification method is verifying that locks engage properly when components reach extended or set positions, then attempting to move the locked component. This testing confirms that locking mechanisms prevent movement. Locks that fail to engage properly or allow movement despite engagement require immediate repair before operations.

18. Correct Answer: A (Cracks or permanent deformation)

During structural inspection, cracks in structural members or permanent deformation suggesting overload or impact damage require attention. Structural cracks can propagate rapidly under load causing catastrophic failure. Permanent deformation indicates the structure has been loaded beyond design limits compromising integrity. Any structural damage requires engineering evaluation before equipment returns to service.

19. Correct Answer: D (No loosening or damage)

When inspecting terminations, it is critical that there is no loosening or damage. Terminations must maintain secure attachment with full grip on rope, no cracks in termination components, and no deformation. Any loosening between rope and socket, cracks, or damage compromises termination strength potentially allowing rope pullout requiring replacement before operations.

20. Correct Answer: C (Functional readable information)

LMI displays must provide functional readable information. The display must be operational showing appropriate capacity and configuration information, and readable from the operator's position under all lighting conditions. Non-functional displays prevent capacity monitoring creating serious overload risks. Illegible displays cannot be used effectively for safe operations requiring repair.

21. Correct Answer: A (Proper seating in all sheave grooves)

During rope inspection, proper seating in all sheave grooves is required. Rope must seat fully in intended grooves throughout the entire reeving path. Improper seating with rope running on sheave flanges causes concentrated wear on both rope and sheaves and can lead to rope jumping from sheaves during operations creating sudden load drops or equipment damage.

22. Correct Answer: D (Cracking, bulging, or deterioration)

When checking hydraulic hoses, cracking particularly in bend areas, bulging indicating internal reinforcement failure, or other visible deterioration requires replacement. These conditions indicate imminent hose failure under pressure. Age-related hardening reducing flexibility also warrants replacement. Failed hoses under pressure can cause loss of function, fire hazards from hot oil spray, or environmental contamination.

23. Correct Answer: A (Lower boom, secure controls, document issues)

Proper shutdown procedure is lowering boom to safe storage angle, securing all controls in neutral or off positions, and documenting any issues requiring attention. This sequence protects equipment from wind damage by reducing boom sail area, prevents unauthorized operation through secured controls, ensures safe configuration, and provides communication about equipment status for next shift or operations.

24. Correct Answer: C (Smooth operation with immediate brake)

During swing testing, proper operation is indicated by smooth acceleration responding to control input, smooth operation at commanded speeds without binding or jerking, smooth deceleration as control reduces, and immediate brake engagement when control returns to neutral. The entire swing cycle should be coordinated and controlled demonstrating proper system function.

25. Correct Answer: B (Low pressure or expired inspection)

When inspecting extinguishers, low gauge pressure indicating charge loss or expired inspection tags indicating service is overdue require attention. Fire extinguishers must maintain proper charge pressure and receive required periodic inspections. Low pressure or expired inspection indicate extinguishers may not function properly in emergencies requiring immediate servicing or replacement.

26. Correct Answer: B (Full insertion with retention devices)

Regarding pins, it must be verified that pins are fully inserted through all connection holes with no gaps visible and that retention devices such as clips, bolts, cotter pins, or lock pins are properly engaged. Partial insertion or missing retention allows pins to back out during operations causing sudden structural connection failure and potential boom collapse. This verification is critical for preventing catastrophic failures.

27. Correct Answer: A (All systems functional and area clear)

During final verification, it is confirmed that all required inspections are complete with no unresolved defects, all systems are functional and ready for operations, and the work area is clear of personnel and obstacles within operating radii and swing paths. This comprehensive final verification ensures complete readiness addressing equipment, personnel, and environmental factors before beginning lift operations.

28. Correct Answer: C (Wear, cracks, or elongated holes)

When inspecting pins, wear reducing pin diameter below specifications, cracks in pin bodies, or elongated pin holes indicate problems requiring correction. Excessive wear or cracks require pin replacement. Elongated holes indicate overloading, impact damage, or fatigue requiring boom section or structural evaluation and possible repair or replacement before returning to service.

29. Correct Answer: A (Smooth operation without leaks)

Proper hydraulic cylinder function is indicated by smooth operation responding proportionally to controls without binding, jerking, or hesitation, no hydraulic leaks from seals, glands, or fittings, and no unusual sounds suggesting cavitation, air entrainment, or mechanical problems. Cylinders should extend and retract smoothly throughout their entire stroke providing precise controlled movement.

30. Correct Answer: D (Per manufacturer wind specifications)

During high-wind shutdown, proper boom positioning is per manufacturer specifications to minimize wind loading. Manufacturers typically recommend lowering boom to moderate angles that reduce wind sail area and loading while maintaining adequate ground clearance. Proper positioning protects boom structure from wind-induced damage during storms while maintaining crane stability through reduced overturning moments from wind forces.