

RED SEAL EXAM PREP

420B Ironworker (Generalist)

Free 50-Question Mock Exam

Practice for the Red Seal / Certificate of Qualification exam

Pass mark: 70% · Aligned to the published occupational standard topic weightings
<https://redsealquiz.ca> · Edition 2026-07

About This Material

Independent, unofficial study resource. This publication is not affiliated with, endorsed by, or approved by the Canadian Council of Directors of Apprenticeship (CCDA), Employment and Social Development Canada, the Red Seal Program, Skilled Trades Ontario, or any provincial or territorial apprenticeship authority. "Red Seal" is used solely to describe the examination for which this material provides practice.

Originality. All questions and explanations in this publication are original works created by the author. This material references only publicly available occupational standards (Red Seal Occupational Standard) for topic alignment and reproduces no content from any actual examination.

No guarantee of results. This study material is provided for educational and informational purposes only. Success on any certification examination depends on many factors, and no representation is made that using this material will result in passing any exam. Exam content, structure, and weightings are set by certification authorities and may change without notice.

Technical accuracy. Code values and technical specifications cited in explanations reflect commonly referenced Canadian standards at the time of writing. Always defer to the current edition of the applicable code or the manufacturer's documentation in real work.

© 2026 the author. All rights reserved. For personal study use by the purchaser only — redistribution, resale, or file sharing is prohibited.

Mock Exam — answer all questions, then check the key

Q1. What is the purpose of "stirrups" or "ties" in a reinforced concrete beam or column?

- A) To position the longitudinal bars at the correct concrete cover depth
- B) To provide anchorage for the formwork
- C) To resist shear and confine the concrete core
- D) To resist longitudinal tension forces along the beam axis

Q2. An ironworker is welding a moment connection on a seismic force-resisting frame. What additional requirement applies compared to a regular gravity connection?

- A) The connection must be welded vertically-up only
- B) Higher amperage settings must be used to achieve deeper penetration
- C) Notch-tough weld metal with CVN requirements
- D) All welds must be made using GTAW process

Q3. On a structural drawing, what does the note "FSBW" refer to?

- A) Fabricated Steel Bearing Wall
- B) Fillet Strength Below Weld line
- C) Field Shop Bolt Work
- D) Full-Strength Butt Weld

Q4. Calculate the minimum fall clearance needed for a 1.8 m lanyard with a 1.07 m maximum deceleration distance. The harness D-ring is 1.5 m above the feet. The required safety factor adds 1.2 m.

- A) 5.57 m
- B) 6.77 m
- C) 4.57 m
- D) 3.87 m

Q5. Synthetic web slings must be removed from service when:

- A) Colour fading or minor surface abrasion is visible
- B) Only when the rated capacity tag is illegible
- C) The sling has been used for more than 500 lifts
- D) There are cuts, tears, or chemical burns visible

Q6. Standard rebar ties are made using:

- A) Epoxy adhesive at each bar crossing
- B) 16-16.5 gauge soft annealed steel wire
- C) Spot welding at each intersection
- D) Thin plastic zip ties rated for 50 kg

Q7. A spud wrench is primarily used during steel erection to:

- A) Tighten high-strength bolts to final torque
- B) Align bolt holes and hold members in place
- C) Drive shear studs into decking
- D) Measure the plumb of columns

Q8. What does a "Personal Fall Arrest System" (PFAS) consist of?

- A) Full body harness, connecting lanyard, and anchor point
- B) Safety net and horizontal lifeline only
- C) Safety boots, hard hat, and safety glasses
- D) Body belt, rope grab, and vertical lifeline

Q9. What does the abbreviation "TOS" mean on a structural steel drawing?

- A) Type Of Section — indicating the steel section type
- B) Total Overall Span — the beam span between columns
- C) Top Of Steel — the elevation of the top surface of the steel beam
- D) Tension On Steel — a notation for tension member design

Q10. An ironworker needs to lift a 6,000 kg steel beam using a two-leg wire rope sling with each leg at 45° from vertical. What is the tension in each sling leg?

- A) 6,000 kg — each leg carries the full load at 45°
- B) 2,121 kg — angle reduces load per leg
- C) 4,243 kg — tension increases with sling angle
- D) 3,000 kg — equal half the total load

Q11. What does a "flag" on a welding symbol indicate?

- A) The weld is to be made in the field (field weld)
- B) The weld is a complete joint penetration weld
- C) All welds on the drawing must be made in this location
- D) The weld must be inspected by UT (ultrasonic testing)

Q12. Direct Tension Indicators (DTIs) are small washers with raised bumps. A connection is properly pretensioned when:

- A) The bumps compress to a specified feeler-gauge gap
- B) All bumps on the DTI are still fully raised
- C) The bolt head has been rotated exactly 1/2 turn from snug-tight
- D) The DTI is cracked and the bumps disappear

Q13. An ironworker reads a structural drawing showing a W310×129 beam. What does this designation tell the ironworker about the section?

- A) A welded plate girder: 310mm web height, 129mm flange width
- B) A cold-formed channel: 310mm leg, 129mm base
- C) A 310mm square hollow section weighing 129 kg
- D) A wide-flange section: 310mm deep, 129 kg per metre

Q14. An ironworker is connecting a steel column base plate to an anchor bolt pattern. Three of four anchor bolts are plumb and aligned, but the fourth is out of position by 25mm. What is the CORRECT course of action?

- A) Weld the base plate to the three correctly positioned bolts and leave the fourth unused
- B) Notify the engineer and GC for an engineering assessment
- C) Force the base plate onto all four bolts by driving with a sledgehammer
- D) Flame cut the misaligned bolt and re-drill the base plate

Q15. Tension control (TC) bolts are identified by a splined end. The installation is complete when:

- A) The bolt head has been rotated 1/2 turn from snug-tight
- B) The bolt has been torqued to the specified value with a calibrated torque wrench
- C) The splined end shears off during installation
- D) The direct tension indicator gap measures zero

Q16. When welding ASTM A572 Grade 50 steel with SMAW, the minimum preheat temperature for material 38 mm thick or greater is approximately:

- A) 10°C (50°F)
- B) 107°C (225°F)
- C) 66°C (150°F)
- D) No preheat required

Q17. What does "100% tie-off" mean for ironworkers during structural steel erection?

- A) The ironworker must use a full 100-foot lifeline at all times
- B) The ironworker must be tied off for 100% of the workday
- C) At least one PFAS connection at all times, even when moving
- D) 100% of the rigging must be secured before erection begins

Q18. What is an equalizer beam (spreader beam) used for in rigging?

- A) To distribute the load between multiple pick points
- B) To measure the balance point of a long structural member
- C) To balance the weight of the crane boom
- D) To spread two crane boom sections for tandem lifts

Q19. What does the term "camber" mean when applied to a structural steel beam?

- A) The vertical angle of the beam connection at the column
- B) A pre-set upward bow built into the beam to compensate for deflection under load
- C) The horizontal curvature of the beam due to lateral wind load
- D) The distance between the top and bottom flanges of the beam

Q20. What is the minimum number of bolts that must be installed before erection bolts can be removed from a connection?

- A) At least 50% of the total bolt count in the connection
- B) At least two bolts or 25% of the bolt count, whichever is greater
- C) All bolts must be snug-tight before erection bolts can be removed
- D) At least one bolt installed in the connection

Q21. What does CSA W47.1 govern?

- A) The classification of welding consumables
- B) The certification of fusion welding companies in Canada
- C) The testing and inspection of completed structural welds
- D) The design of structural steel connections

Q22. A weld inspection reveals "undercut" along the toe of a fillet weld. What caused this?

- A) Moisture in the electrode coating
- B) Excessive travel speed or amperage at the toe
- C) Insufficient root opening in the groove
- D) Insufficient preheat temperature

Q23. Who is responsible for ensuring a lift plan exists for a critical lift?

- A) The project's structural engineer only
- B) The rigging foreman and ironworker in charge
- C) The certified crane operator only
- D) The crane manufacturer's representative

Q24. What is the purpose of a base plate in a steel column installation?

- A) To hold the anchor bolts
- B) To prevent corrosion of the column base
- C) To spread the column load over the foundation
- D) To allow lateral adjustment after erection

Q25. In structural steel work, what does CSA W59 govern?

- A) The safety requirements for welding fumes
- B) The design requirements for welded steel construction
- C) The testing of welding consumables
- D) The certification of welders for structural work

Q26. What is the effective throat of a 12 mm fillet weld?

- A) 10 mm
- B) 12 mm
- C) 6 mm
- D) 8.5 mm

Q27. When installing high-strength bolts using the turn-of-nut method, what is the first step?

- A) Apply full final torque immediately
- B) Bring all bolts to snug-tight first
- C) Install all bolts finger-tight only
- D) Apply lubricant to all bolt threads

Q28. Which crane hand signal means "STOP"?

- A) Arm extended, palm facing down, moving arm side to side
- B) Both arms raised above head
- C) Arm extended, palm facing the crane operator, fist closed
- D) One arm raised, rotating at the elbow

Q29. Rebar chairs (bar supports) are used to:

- A) Splice rebar together at joints
- B) Hold rebar at the correct height for cover
- C) Hold vertical rebar in position while tying
- D) Mark the location of rebar on the concrete surface after pouring

Q30. Rebar that has mill scale (light rust) on its surface before placement — what action should the ironworker take?

- A) The bars must be sandblasted clean before placement
- B) Replace all rusty bars with new material
- C) Apply a rust inhibitor coating before placing in forms
- D) Place the bars as is — light rust is acceptable

Q31. An ironworker inspects a wire rope sling before a critical lift and finds 4 broken wires in one rope lay of a 6×19 IWRC wire rope. What action should be taken?

- A) Remove the sling from service immediately
- B) The sling may be used if the broken wires are not load-bearing
- C) The sling may be used — limit is 6 broken wires per lay
- D) Tag the sling for monitoring and continued use

Q32. Safety nets for fall protection in steel erection must extend beyond the edge of the work surface by at least:

- A) 3 m (10 ft) from the work surface edge
- B) 2.4 m (8 ft) for drops up to 6 m
- C) The net must extend to the nearest column line
- D) 1.5 m (5 ft) from the work surface edge

Q33. What is a "beam clamp" used for in ironworking?

- A) To hold a beam in plumb during erection until it is bolted
- B) To attach rigging to a beam flange without welding
- C) To clamp the welding electrode holder to the beam during welding
- D) To permanently connect two beams at a splice

Q34. What is the maximum free-fall distance permitted in a personal fall arrest system under CSA Z259?

- A) 1.2 m (4 ft)
- B) 0.6 m (2 ft)
- C) 1.8 m (6 ft)
- D) 3 m (10 ft)

Q35. During a crane lift, what is the purpose of a tagline?

- A) To provide an extra rigging connection in case the main sling fails
- B) To control the rotation and swing of the load
- C) To attach the load to the crane hook
- D) To measure the length of the lift path

Q36. A wire rope sling has a WLL of 10,000 kg at 90°. What is the effective WLL when used as a choker hitch?

- A) 8,000 kg — choker hitch reduces capacity by 20%
- B) 7,500 kg — choker hitch reduces capacity by 25%
- C) 10,000 kg — choker hitch does not reduce capacity
- D) 5,000 kg — choker hitch reduces capacity by 50%

Q37. What do the deformations (ribs) on deformed rebar do?

- A) Provide identification markings for the steel mill
- B) Increase the bar weight to improve resistance to impact loads
- C) Mechanically interlock with concrete to improve bond and force transfer
- D) Reduce the bar cross-section to save material at low-stress locations

Q38. On a structural drawing, what does the symbol "EL. 12500" typically mean?

- A) The element has a design load of 12,500 kg
- B) The element is 12,500 mm in length
- C) Element number 12,500 on the fabrication list
- D) The point's elevation above the project datum

Q39. During structural steel erection, an ironworker is bolting a beam connection. The engineer specifies A325 3/4" bolts in a slip-critical connection. What minimum number of bolts must be installed before the crane can release the member?

- A) All bolts must be installed and tightened before crane release
- B) One bolt per connection — sufficient for temporary stability
- C) Minimum 2 bolts per end, per the erection procedure
- D) 50% of final bolt count, installed hand-tight only

Q40. Before using any rigging hardware (shackles, hooks, chains) on a job site, the ironworker should:

- A) Test each piece by applying twice the WLL to check for deformation
- B) Apply a fresh coat of oil to all moving parts
- C) Visually inspect for damage and verify adequate WLL
- D) The equipment only requires inspection during the annual company audit

Q41. What is the minimum D:d ratio (sheave diameter to wire rope diameter) recommended for standard wire rope?

- A) 18:1
- B) 6:1
- C) 26:1
- D) 12:1

Q42. What is a "lap splice" in reinforcing steel?

- A) An overlap where two parallel bars transfer stress
- B) A mechanical coupler that joins two rebar end-to-end
- C) A bar bent into a U-shape around another bar
- D) A weld joining two rebar pieces at their ends

Q43. A structural drawing shows "4-M20 A325 bolts" at a beam-to-column shear tab connection. What does this mean?

- A) The bolts are metric, Group 4 size, 20 kN capacity
- B) 4 machine bolts, 20 mm diameter, Grade A325 high-strength bolts
- C) The connection uses 4 bolts, metric size M20 (20 mm diameter), ASTM A325 high-strength
- D) The bolt group has a shear capacity of 4,000 N per M20 bolt per A325 standard

Q44. A complete joint penetration (CJP) groove weld requires:

- A) Weld metal penetrating the joint's full thickness
- B) Post-weld heat treatment regardless of steel grade
- C) Weld metal to fill the groove at least halfway
- D) At least three weld passes in the groove

Q45. A gang of ironworkers is erecting steel 12m above grade. The controlled decking zone (CDZ) provisions allow workers within 3m of the leading edge to work without guardrails under specific conditions. Which of the following does NOT qualify as a condition for using the CDZ provision?

- A) Decking bundles are placed to serve as barriers at the leading edge
- B) Workers are wearing and using personal fall arrest systems (PFAS)
- C) The CDZ has a designated competent person monitoring compliance
- D) No other falls hazards within the CDZ exist

Q46. A hydraulic bolt tensioner is used instead of a torque wrench for high-strength bolt installation. What is the key advantage?

- A) It works on all bolt grades including stainless steel and aluminum
- B) It applies direct tension, eliminating torque variability
- C) It is lighter and cheaper than a torque wrench
- D) It can install bolts in confined spaces where a torque wrench cannot fit

Q47. On an erection drawing, a beam is shown with a dashed "camber" indicator. The note says "Camber 25 mm". What action does the ironworker take?

- A) Add 25 mm shim plates under the beam at midspan
- B) Install the beam with the upward bow facing up
- C) Apply a 25 mm offset at the beam end connections
- D) Request the beam be re-fabricated to remove the camber

Q48. Steel decking (floor deck) must be placed in what sequence relative to the beam below?

- A) Always starting at the column and working toward the beam midspan
- B) From the crane or access side outward
- C) Starting from the center of the bay and working outward
- D) It can be placed in any convenient order

Q49. A crane is lifting a 20,000 kg load at a 15m radius. The load chart shows maximum lift capacity at 15m is 18,000 kg (with all outriggers fully extended on firm ground). What should the ironworker signalperson communicate to the operator?

- A) Proceed if the lift will be completed in under 2 minutes
- B) Proceed if the crane manufacturer approves in writing
- C) Proceed — crane charts include a 10% safety margin for occasional overloads
- D) Stop the lift — it exceeds the chart capacity

Q50. An optical level or builder's level is used during structural steel erection to:

- A) Read the crane load chart to determine crane capacity
- B) Establish level reference elevations across the structure
- C) Measure the plumb of columns using the level bubble
- D) Check the alignment of bolt holes in connections

Answer Key & Explanations

Q1. Answer: C

Stirrups (beams) and ties (columns) resist shear and torsion forces, confine the concrete core to increase ductility, and brace the longitudinal bars against buckling under compression load.

Q2. Answer: C

Seismic connections experience large cyclic deformations and must absorb energy through plastic deformation without fracture. Weld metal must meet notch-toughness requirements verified by CVN (Charpy V-notch) impact testing at -29°C or lower to prevent brittle fracture.

Q3. Answer: D

FSBW (Full Strength Butt Weld) or CJP (Complete Joint Penetration) groove weld indicates that the weld must develop the full tensile strength of the connected base metal — the weld is not the weak link. This requires 100% penetration through the joint thickness, usually verified by visual inspection plus UT (ultrasonic testing) or radiography. It is different from: a partial joint penetration (PJP) weld, which does not penetrate the full thickness and has reduced capacity; a fillet weld, which joins members at a surface (no groove); and a plug or slot weld. FSBW/CJP welds are required at moment connections (beam-column moment joints) and splice plates carrying tension — they cost more (more prep, more passes, more inspection) than fillet welds.

Q4. Answer: A

Fall clearance = lanyard length (1.8 m) + deceleration distance (1.07 m) + D-ring height (1.5 m) + safety factor (1.2 m)
= 5.57 m minimum clearance below anchor.

Q5. Answer: D

Synthetic slings are removed from service for any cuts or tears that penetrate fibres, acid or caustic burns, heat damage above 90°C, loss of more than 10% of sling width, distorted hardware, or missing/illegible capacity tags.

Q6. Answer: B

Rebar ties are made from 16 to 16.5 gauge (approximately 1.6 mm diameter) smooth, soft annealed steel wire, twisted with a tier tool. Multiple tie patterns exist for different conditions (snap tie, saddle tie, figure-8 tie).

Q7. Answer: B

The tapered end of a spud wrench is inserted into misaligned bolt holes in connections to align them so bolts can be inserted, temporarily holding members in place. The wrench end is used to snug bolts temporarily.

Q8. Answer: A

A PFAS has three essential components: (1) full-body harness, (2) connecting means (lanyard, self-retracting lifeline, rope grab + lifeline), and (3) an anchor point with sufficient strength.

Q9. Answer: C

TOS (Top of Steel) is an elevation reference on structural drawings indicating the height of the top flange of a beam, measured from the project datum. It is used to coordinate with the concrete deck, mechanical, and architectural drawings. Common related notations: BOS (Bottom of Steel — soffit elevation, important for clearance), TOS is NOT the same as finished floor elevation (which is TOS + deck slab thickness + topping if any). Wrong answers often confuse TOS with the beam depth or with the centreline elevation. For steel erection: when setting beam elevation, you level to the TOS — not to the bottom flange or web centreline.

Q10. Answer: C

Sling leg tension = (Load / number of legs) × (1 / cos θ). $\theta = 45^\circ$ from vertical. Tension = $(6,000/2) \times (1/\cos 45^\circ) = 3,000 \times 1.414 = 4,243$ kg per leg. The load on each sling leg INCREASES as the angle from vertical increases. At 60° , the factor is 2.0 — each leg carries the full load. This is why angles beyond 60° from vertical are generally avoided.

Q11. Answer: A

A flag on the weld symbol reference line indicates a field weld — one that is to be made during erection at the job site, as opposed to a shop weld made during fabrication.

Q12. Answer: A

DTIs work by compressing their raised protrusions as bolt pretension increases. When sufficient tension is reached, the gaps between the protrusions and the contact surface fall below the specified maximum refusal value, verified with a feeler gauge.

Q13. Answer: D

W-shape designation: W = Wide Flange. First number = nominal depth in mm (310mm). Second number = mass in kg/m (129 kg/m). This is a standard AISC/CISC wide-flange designation used throughout Canadian structural steel practice. The actual depth may vary slightly from nominal. W310×129 is a heavy section used for heavily loaded beams and columns.

Q14. Answer: B

Anchor bolt misalignment is a structural deficiency that requires engineering assessment before proceeding — notify the engineer and general contractor. Forcing the base plate distorts the anchor bolt, potentially cracking the grout and concrete embedment. Flame cutting a structural anchor bolt changes its material properties and may be prohibited. The engineer must determine if the misalignment is within tolerance, whether repositioning is possible, or if redesign is needed.

Q15. Answer: C

TC bolts have a breakneck groove at the splined end. When minimum pretension is achieved, the torque reaction causes the spline to shear off cleanly, providing visual verification that the required minimum pretension has been reached.

Q16. Answer: B

Per AWS D1.1 Table 4.2, for A572 Gr.50 (Group II steel) and material thickness over 38 mm (1.5 in), the minimum preheat temperature is 107°C (225°F).

Q17. Answer: C

100% tie-off means continuous connection — the ironworker must have at least one PFAS connection at all times, including while moving or transitioning their tie-off point. A double-lanyard or SRL with a second connection allows transitioning without a gap.

Q18. Answer: A

An equalizer beam distributes the load between multiple sling attachment points, controls sling angles to prevent sling angle problems, and prevents horizontal compressive forces from being transmitted into the load.

Q19. Answer: B

Camber is a deliberate upward curve fabricated into a beam so that under design load, the beam deflects back to a level position. Common in long-span or heavily loaded beams.

Q20. Answer: B

Per AISC and CISC requirements, a minimum of two bolts or 25% of the bolt group (whichever is greater) must be installed and snug-tight before erection bolts are removed.

Q21. Answer: B

CSA W47.1 (Certification of Companies for Fusion Welding of Steel) governs the certification of welding companies — it certifies the company, not individual welders. Certified companies must have qualified welding supervisors, approved welding procedures (WPSs), and a documented quality control system. This is different from: CSA W59 (which governs the design and fabrication requirements for welded steel structures), CSA W178.2 (which certifies individual welding inspectors), and AWS D1.1 (the American Structural Welding Code used as a reference). On a Canadian structural steel project, the fabricator or erector must hold a current CSA W47.1 certification — this is a mandatory contract requirement.

Q22. Answer: B

Undercut is a groove melted into the base metal at the weld toe that is not filled by weld metal. It is caused by excessive heat, amperage, or travel speed melting the base metal at the toe, or an improper electrode angle.

Q23. Answer: B

The rigging crew (foreman/competent rigger) and the ironworker in charge of the lift, in coordination with the site supervisor, are responsible for preparing or implementing the lift plan for critical lifts. The engineer may provide structural input.

Q24. Answer: C

A base plate distributes the concentrated column load over a larger bearing area on the concrete foundation, reducing bearing stress to within allowable limits.

Q25. Answer: B

CSA W59 (Welded Steel Construction — Metal Arc Welding) specifies design, fabrication, and erection requirements for welded steel structures in Canada, including joint design, acceptable workmanship, and inspection criteria. It is often confused with: CSA W47.1 (which certifies welding companies — not design requirements), CSA W59 is the structural welding CODE (what must be built and to what standard), while W47.1 is the company CERTIFICATION standard (who is allowed to build it). AWS D1.1 is the equivalent American standard; many Canadian projects reference both. For Red Seal ironworker exam: know that W59 = fabrication and design standard; W47.1 = company certification; W178.2 = inspector certification.

Q26. Answer: D

For a standard fillet weld with equal legs, the theoretical throat = $\text{leg} \times \sin(45^\circ) = 12 \times 0.707 \approx 8.5 \text{ mm}$. The effective throat is used to calculate weld strength.

Q27. Answer: B

Turn-of-nut requires all bolts in the connection to be brought to the snug-tight condition first (full effort of an ironworker with a spud wrench), then a specified rotation is applied to achieve the minimum pretension.

Q28. Answer: A

The universal crane signal for STOP is arm extended horizontally with palm facing down, moved side to side. EMERGENCY STOP uses both arms in this position.

Q29. Answer: B

Bar chairs and supports are plastic or metal supports placed under rebar to maintain the required concrete cover by holding the bars at the correct height above the form (distance from bottom of rebar to bottom of slab).

Q30. Answer: D

Light surface rust is acceptable and actually improves bond between rebar and concrete. Only heavy, flaking (loose) rust that significantly reduces the bar cross-section must be removed. CSA A23.1 permits light rust.

Q31. Answer: A

ASME B30.9 discard criteria for 6×19 wire rope: 3 broken wires in one rope lay or 6 in any rope lay length of 6 times the rope diameter. Finding 4 broken wires in one lay exceeds the 3-wire limit — remove from service immediately, cut into short pieces to prevent reuse, and report to the rigger-in-charge. All wires in a sling assembly must remain serviceable — there are no partial-use allowances.

Q32. Answer: B

Per OSHA 1926.502 and equivalent Canadian standards, safety nets must extend at least 2.4 m (8 ft) beyond the edge for drops of 6 m or less, 3 m for drops 6–12 m, and 3.6 m beyond for drops over 12 m.

Q33. Answer: B

Beam clamps attach to a beam flange by clamping action, providing a temporary rigging point for hooks, slings, and blocks — for hoisting, pulling, or hanging equipment without welding, drilling, or otherwise permanently modifying the beam.

Q34. Answer: A

CSA Z259.11 and most OHS regulations limit free fall in a PFAS to 1.2 m (4 ft) for shock-absorbing lanyards. Positioning the anchor above the D-ring minimizes free fall distance.

Q35. Answer: B

Taglines allow workers to guide and control a suspended load from a safe distance, preventing rotation and swing without placing workers directly under or near the load.

Q36. Answer: B

A standard choker hitch reduces the rated capacity of a wire rope sling to 75% of its vertical rating — a 25% reduction — when the angle of choke is 120° or greater, due to the bending and pinching of the rope at the choke point ($10,000 \text{ kg} \times 0.75 = 7,500 \text{ kg}$). At choke angles below 120° the capacity is reduced further.

Q37. Answer: C

The transverse and longitudinal ribs on deformed bar create mechanical interlock with the surrounding concrete, dramatically improving bond strength compared to smooth bars.

Q38. Answer: D

EL. (Elevation) followed by a number (e.g., EL. 12500) indicates the finished height of that point in millimetres above the project datum — typically the finished first floor (FF) established at EL. 0.000. Elevations above datum are positive; below datum are negative. This is different from: a grid coordinate (which locates a point in plan, not in height), a dimension (which measures distance between two specific points), or a TOS/BOS notation (which is a specific elevation of the top or bottom of a steel member). When setting anchor bolts or erecting columns, always verify the elevation against the structural drawings — not the architectural drawings, which may use a different datum.

Q39. Answer: C

CISC and AISC erection guidelines require a minimum of 2 bolts per connection — or enough to safely support erection loads, as specified in the erection procedure or by the engineer — before the crane can release a member. One bolt provides insufficient rotation restraint — the connection can pivot. With 2 bolts at each end, the member is stable against rotation. Full bolt tightening follows per the erection sequence after multiple members create a stable structure.

Q40. Answer: C

Pre-use inspection of rigging hardware is mandatory. Visually inspect for cracks, deformation (hooks opening, shackle bowing), corrosion reducing cross-section, missing or illegible load ratings, and pin security — and verify the WLL is adequate for the lift.

Q41. Answer: C

The standard minimum D:d ratio for wire rope on a sheave is 26:1 for 6×19 construction and varies by rope construction. Using smaller sheaves causes excessive bending fatigue and reduces rope life.

Q42. Answer: A

A lap splice is an overlapping zone where two bars run parallel: the bar ends overlap by a specified length (development length × splice factor) so that bar forces transfer through bond with the surrounding concrete.

Q43. Answer: C

4-M20 A325 means 4 bolts of M20 size (20 mm nominal diameter) meeting ASTM A325 high-strength structural bolt requirements.

Q44. Answer: A

A CJP weld requires weld metal to completely penetrate the full thickness of the joint, filling the entire cross-section and achieving full fusion. It is required in joints subject to tension, cyclic, or seismic loading.

Q45. Answer: A

Decking bundles do NOT qualify as CDZ barriers. CDZ conditions (per provincial OH&S regulations and OSHA 1926 Subpart R): 1) Only decking work is performed. 2) Employees stay back 3m from edge unless using PFAS. 3) Decking is not used as a barrier (bundles shift and are removed). 4) A competent person monitors the zone. Decking bundles appear substantial but are not approved CDZ barriers — they move and are intentionally removed.

Q46. Answer: B

Hydraulic tensioners apply direct tensile load to the bolt by pulling the threaded end rather than applying torque, eliminating the torque-to-tension variability that comes from lubrication, thread condition, and technique. This achieves more consistent and accurate pretension.

Q47. Answer: B

Camber is built into the beam at the fabrication shop, so no field action is required beyond correct orientation. The ironworker must install the beam with the camber (upward bow) oriented correctly — the camber marking (typically a paint mark) faces up.

Q48. Answer: B

Decking must be placed from the crane or access side outward, never placing unsupported deck ahead of the safe access limit. OSHA/OHS regulations prohibit placing loose decking more than two beam spans ahead of secured decking.

Q49. Answer: D

Load chart values are maximums — they MUST NOT be exceeded under any circumstances. Crane load charts already include safety factors per CSA Z150. Exceeding the chart rating voids the chart, creates an unacceptable risk of crane overturning, and is a criminal liability. The lift must be stopped and re-planned: decrease the lift radius (boom in), improve ground bearing with outrigger pads, or bring in a larger crane.

Q50. Answer: B

A builder's level (optical or laser) establishes and verifies a horizontal datum plane across the site. It is used to set column base plate elevations, check beam levelness, and verify floor deck elevations.

Scored under 70%?

The real exam draws from a much wider pool. The **420B Ironworker (Generalist) Complete Question Bank** gives you every question on our platform with full explanations and key-concept summaries — built to close exactly the gaps this mock exposed.

<https://redsealquiz.ca>