

# PRACTICE EXAM 12: RED SEAL CARPENTER INTERPROVINCIAL SIMULATION (100 QUESTIONS)

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1. A carpenter is cutting concrete board (Hardie board) with a circular saw. The saw produces a large volume of fine dust. The dust from concrete board contains crystalline silica. What respiratory protection level is required for this operation?

A. A standard nuisance dust mask (single-strap paper mask) provides adequate protection from silica particles

B. An N95 disposable respirator is the minimum required for short-duration occasional cuts in open areas

C. A P100 half-face respirator (or equivalent) is recommended for sustained cutting operations because crystalline silica dust causes silicosis — a progressive, irreversible, and potentially fatal lung disease

D. No respiratory protection is needed outdoors because wind disperses the silica dust below hazardous levels

2. A carpenter is preparing to use a pneumatic nailer for the first time after it has been stored for several months. Before connecting the air supply and loading nails, what inspection should the carpenter perform?

A. Visually inspect the tool for damage, check that all safety devices are functioning (trigger lock, contact trip), verify the driver and magazine are clean and free of debris, and confirm the exhaust port is not blocked

B. Test-fire the nailer into a scrap piece without safety equipment to confirm the tool functions normally

C. Connect the air supply at maximum pressure to blow out any dust or debris from the internal mechanism

D. Remove the trigger assembly and inspect the internal firing pin for wear under a magnifying glass

3. A carpenter working on an elevated floor platform notices that the temporary guardrail at the platform edge has been removed by another trade to move materials. The platform is 4 metres above grade. What should the carpenter do?

- A. Continue working but stay at least 2 metres from the unguarded edge as a personal safety precaution
- B. Work near the edge but use a long tool handle to reach the edge area without getting close personally
- C. Notify the other trade and wait until they have completed their task and reinstalled the guardrail
- D. Stop work immediately, secure the area to prevent anyone from approaching the unguarded edge, and report the missing guardrail to the supervisor for immediate reinstallation

4. A carpenter is using an electric drill to bore holes in wet lumber outdoors. The drill is connected to a standard household extension cord without a GFCI. A coworker mentions that this setup is unsafe. Why is a GFCI required for this situation?

- A. The GFCI prevents the drill motor from overheating when boring through the denser wet wood fibres
- B. Wet conditions create a direct path for electric current to flow through the carpenter's body to ground if the drill develops a fault — a GFCI detects this leakage current and cuts power within milliseconds
- C. The GFCI prevents voltage spikes caused by the drill motor that damage the extension cord insulation
- D. Wet wood generates static electricity during drilling that the GFCI dissipates through the ground wire

5. A scaffold has a maximum platform load rating of 50 pounds per square foot (medium duty). The carpenter needs to stack bundles of roofing shingles on the scaffold platform to hand them up to the roof crew. Each bundle weighs approximately 30 kg (66 pounds). The platform is 5 feet × 7 feet (35 square feet). What is the maximum total load the platform can support?

- A. 1,750 pounds (approximately 795 kg) based on multiplying the platform area by the load rating per square foot
- B. 66 pounds (30 kg) because only one bundle can be placed on the platform at any time for safety

- C. 875 pounds (397 kg) based on using the light-duty rating of 25 psf instead of the actual 50 psf rating
- D. Unlimited weight as long as the shingles are distributed evenly across the entire platform surface area

6. A carpenter observes that a coworker has removed the blade guard, riving knife, and anti-kickback pawls from a table saw "because they get in the way." The carpenter knows this creates an extremely dangerous condition. What specific hazard does the absence of these safety devices create?

- A. The exposed blade overheats without the blade guard's airflow and may warp during extended cutting
- B. The saw motor runs faster without the resistance of the guard assembly, exceeding the safe blade speed
- C. Without the riving knife and anti-kickback pawls, the cut material can close on the back of the blade and be thrown at the operator at high velocity, and the exposed blade can lacerate hands during setup
- D. The blade becomes duller faster without the guard because sawdust recirculates and re-contacts the teeth

7. When using a powder-actuated tool (Ramset) to fasten a bottom plate to a concrete floor, the carpenter must select the correct power level (colour-coded cartridge). What happens if the cartridge power is too high for the concrete thickness?

- A. The fastener does not penetrate the concrete and bounces back toward the operator at the firing point
- B. The concrete surface cracks in a circle around the fastener head from the excessive impact energy
- C. The fastener mushrooms on the tip and cannot be removed without damaging the bottom plate lumber
- D. The fastener can penetrate completely through thin concrete and exit the bottom or side, becoming a projectile that endangers workers on the other side or below

8. A carpenter is setting up a portable table saw on a temporary plywood work surface. The saw has four rubber feet but no clamps or fasteners holding it to the plywood. During a rip cut, the saw vibrates and shifts position on the plywood surface. Why is this unsecured setup dangerous?

- A. The shifting saw changes the distance between the blade and the fence, producing inaccurate rip widths
- B. The shifting saw can move the spinning blade into the operator's hand position or change the alignment mid-cut, causing the workpiece to bind and kick back toward the operator
- C. The saw vibration loosens the blade arbour nut, causing the blade to wobble during subsequent cuts
- D. The shifting saw damages the temporary plywood surface and creates an uneven platform for future cuts

9. A carpenter is working near a crane operation on a construction site. The crane is lifting precast concrete panels to the second storey. The carpenter's work area is adjacent to but not directly under the crane's swing radius. What safety precaution applies to the carpenter in this situation?

- A. The carpenter must maintain awareness of the crane's position and load at all times, stay out of the marked exclusion zone, and follow all signal person directions — even loads outside the direct swing path can swing or fall if a rigging failure occurs
- B. The carpenter is safe as long as they are not directly beneath the load during the lifting operation
- C. The carpenter only needs to wear a hard hat, which provides protection from any objects falling nearby
- D. The carpenter should continue working normally because the crane operator is responsible for all safety

10. A carpenter is cutting a piece of lumber that is slightly bowed. The carpenter places the bowed piece on the mitre saw table with the bow facing upward (concave side down). When the blade engages the material, what hazard does this orientation create?

- A. The blade will burn the wood at the contact points because the bow creates uneven pressure on the teeth
- B. The cut will be inaccurate because the material rocks on the two contact points during the saw stroke
- C. The downward blade force can flatten the bowed material suddenly, causing it to pinch the blade and spring back — the material may kick sideways or the off-cut may be thrown from the saw

D. The bowed orientation causes the blade to cut at an angle rather than square to the material surface

11. A carpenter is using a wood chisel to remove waste from a mortise joint. The chisel slips off the workpiece and travels toward the carpenter's free hand, which is holding the workpiece directly in the path of the chisel. What fundamental hand tool safety rule did the carpenter violate?

A. The carpenter should have used a mallet instead of hand pressure to drive the chisel through the waste

B. The carpenter should have applied cutting oil to the chisel edge to reduce friction and prevent slipping

C. The carpenter should have sharpened the chisel before beginning the mortise cut to prevent slippage

D. The carpenter's free hand must never be placed in the path of a cutting tool — always keep the supporting hand behind or to the side of the cutting edge direction

12. A construction site has a designated smoking area away from the building under construction. A carpenter observes a worker smoking near a stack of OSB panels, adhesive containers, and sawdust accumulation in the material staging area. Why is this a fire hazard?

A. The smoke damages the surface coating on OSB panels and reduces their structural rating over time

B. Sawdust, adhesive vapours, and OSB panels are combustible materials — a cigarette or match can ignite sawdust, adhesive vapours, or the materials directly, potentially causing a rapidly spreading fire

C. The heat from the cigarette can warm the adhesive containers to their flash point during hot weather

D. Tobacco smoke chemically reacts with the adhesive resins in OSB panels and weakens the structural bond

13. A carpenter encounters the notation "typ." on a construction drawing next to a dimension for anchor bolt spacing. The notation reads "Anchor bolts @ 1800 o.c. typ." What does "typ." mean?

A. "Typical" — this spacing applies at all similar anchor bolt locations throughout the building unless a specific dimension is noted otherwise at a particular location

- B. "Temporary" — the spacing will be revised in a future drawing revision before construction begins
- C. "Typed" — indicating that the dimension was computer-generated rather than hand-drawn on the plan
- D. "Type" — indicating a specific bolt type classification that corresponds to the structural specification

14. A carpenter must calculate the diagonal of a rectangular building to verify the layout for square. The building measures 18.0 metres by 12.0 metres. Using the Pythagorean theorem, what should the diagonal measure?

- A. 30.0 metres based on adding the two side dimensions together for the diagonal measurement
- B. 15.0 metres based on averaging the two dimensions and using the average as the diagonal length
- C. 21.63 metres based on  $\sqrt{(18.0^2 + 12.0^2)} = \sqrt{(324 + 144)} = \sqrt{468} = 21.63$  metres
- D. 216.0 metres based on multiplying the two dimensions without taking the square root of the result

15. A carpenter is estimating the concrete volume for a set of 8 rectangular piers. Each pier is 400 mm  $\times$  400 mm in cross-section and 2.0 metres tall. What is the total concrete volume for all 8 piers?

- A. 0.32 cubic metres based on calculating only one pier and not multiplying by the total number of piers
- B. 12.8 cubic metres based on using the dimensions in millimetres without converting to metres first
- C. 1.28 cubic metres based on doubling the correct answer due to a multiplication error in the calculation
- D. 2.56 cubic metres based on each pier volume of  $0.4 \times 0.4 \times 2.0 = 0.32 \text{ m}^3 \times 8 \text{ piers} = 2.56 \text{ m}^3$

16. A carpenter is reading a detail drawing that shows a wall section from the footing to the roof. The section drawing includes the abbreviation "EPS" next to the exterior insulation layer on the foundation wall. What material does "EPS" represent?

- A. "Engineered Plywood Sheathing" — a structural panel applied to the exterior of the foundation wall

- B. "Expanded Polystyrene" — a rigid foam insulation board commonly used on foundation walls
- C. "Exterior Protection System" — a waterproofing membrane applied to the below-grade concrete surface
- D. "Epoxy Protection Seal" — a chemical coating applied to the concrete surface for corrosion protection

17. When reading construction drawings, a carpenter notices that hidden lines (dashed lines) are used to show elements that are not visible in the current view. On a floor plan, a dashed rectangle is shown above a room. What does this dashed rectangle most likely represent?

- A. A structural element above the plan cut — such as a beam, header, or soffit — that is not visible at the floor level but is shown for reference because the carpenter must account for it during construction
- B. An element that has been deleted from the design and is shown only as a record of the original layout
- C. An underground utility that runs beneath the floor slab at that location requiring special excavation
- D. A future expansion area that will be built in a later construction phase after the initial building is complete

18. A carpenter needs to calculate the quantity of sheathing tape required to seal all the joints on the exterior sheathing of a building. The building is 15.0 m long, 10.0 m wide, and 2.74 m tall. The sheathing panels are 1.22 m × 2.44 m, installed vertically. Approximately how many vertical joints exist on the long walls combined?

- A. 12 vertical joints on each long wall, totaling 24 vertical joints for both long walls combined
- B. 6 vertical joints total for the entire building perimeter based on one joint per two panel widths
- C. Approximately 24 vertical joints on the two long walls: each long wall has about 12 joints ( $15.0 \div 1.22 \approx 12.3$  panels per wall, creating approximately 11-12 joints per wall × 2 walls)
- D. 48 vertical joints based on doubling the panel count for joints on both the interior and exterior faces

19. A carpenter is performing a layout check on a foundation wall before setting the sill plate. The carpenter measures the foundation wall diagonals: one diagonal is 15,250 mm and the other is 15,230 mm. The difference is 20 mm. Should the carpenter proceed with the sill plate installation?

A. No, the 20 mm difference requires the foundation to be rebuilt because it will cause significant problems

B. Yes, a 20 mm difference over a 15.25-metre diagonal is within normal residential construction tolerance, but the carpenter should split the difference when setting the sill plate to centre the framing on the foundation

C. No, the carpenter must wait for the structural engineer to verify the foundation before proceeding

D. Yes, proceed without adjustment because the framing will automatically correct the foundation variance

20. A carpenter is calculating the total rise of a stairway from the garage floor (elevation 99.000 m) to the main floor (elevation 101.700 m). Both elevations are finished floor levels. What is the total rise?

A. 99.000 metres based on using only the lower elevation as the total rise for the stairway calculation

B. 200.700 metres based on adding the two elevations together instead of subtracting them for the rise

C. 1.350 metres based on dividing the elevation difference by two for a half-rise intermediate landing

D. 2.700 metres based on subtracting the lower elevation from the upper elevation:  $101.700 - 99.000 = 2.700$  m

21. A carpenter is laying out a curved wall on a concrete slab. The wall follows an arc with a radius of 3.0 metres and subtends an angle of 90 degrees (a quarter circle). To mark the curve on the slab, the carpenter drives a nail at the centre point, ties a string 3.0 metres long to the nail, and swings the arc. What is the length of the curved wall along the arc?

A. 3.0 metres based on the radius being equal to the arc length for any 90-degree quarter circle

B. 6.0 metres based on doubling the radius for the arc length without using the circumference formula

C. 9.42 metres based on calculating the full circumference instead of just the quarter-circle arc length

D. 4.71 metres based on the arc length formula:  $(2\pi r) \times (\text{angle}/360) = (2 \times 3.14 \times 3.0) \times (90/360) = 18.85 \times 0.25$

22. A carpenter is checking a spirit level for accuracy. The carpenter places the level on a flat surface and notes the bubble position. Then the carpenter rotates the level 180 degrees (end for end) on the same surface and checks the bubble again. If the bubble moves to a different position after rotation, what does this indicate?

A. The surface is not level and the carpenter must find a flatter surface to check the level's accuracy

B. The level is out of calibration — the vial is not centred relative to the level body, and the level must be adjusted or replaced because it will give false readings

C. The bubble is trapped by an air pocket in the vial fluid that prevents it from moving freely to centre

D. The level's magnets are interfering with the bubble fluid and the level must be demagnetized before use

23. A project drawing specifies that a beam must be at an elevation of "TOS 103.450." The carpenter has established a Height of Instrument (HI) of 104.200 metres. What rod reading will the carpenter see when the grade rod is placed on a surface that is at the correct beam elevation?

A. 0.750 metres based on subtracting the required elevation from the Height of Instrument:  $104.200 - 103.450 = 0.750$  m

B. 103.450 metres based on using the beam elevation directly as the rod reading on the levelling rod

C. 207.650 metres based on adding the HI and the beam elevation together for the combined reading

D. 1.500 metres based on doubling the correct rod reading for a safety factor in the elevation check

24. When laying out wall plates on a subfloor, the carpenter discovers that the subfloor panels were installed slightly out of square — the building is 12 mm out of square over the full width. The carpenter must decide how to handle this variance when laying out the walls. What is the best approach?

- A. Realign the subfloor by removing and re-nailing the panels to correct the 12 mm variance completely
- B. Lay out the walls perfectly square regardless of the subfloor and accept the resulting gap at the perimeter
- C. Split the 12 mm difference between opposite walls so each wall absorbs approximately 6 mm of the variance, producing the least visible deviation from square at any single point
- D. Lay out the walls to follow the subfloor exactly so the wall bottom plates align with the panel edges

25. A carpenter is estimating material for drywall installation. The room has a flat ceiling measuring 4.5 m  $\times$  6.0 m. Standard drywall panels are 1.22 m  $\times$  3.66 m (4'  $\times$  12'). The panels will be installed perpendicular to the ceiling joists. How many panels are needed for the ceiling?

- A. 4 panels based on dividing only the room width by the panel width without accounting for the length
- B. 6 panels based on dividing the room area by a panel area of 4.5 m<sup>2</sup> using an incorrect panel dimension
- C. 9 panels based on dividing the room length by the panel width to get rows, then multiplying by rows needed
- D. Approximately 5 panels: the panels run 3.66 m in one direction (covering 4.5 m width requires 2 rows of panels with a cut piece), and 6.0 m length  $\div$  1.22 m per panel = approximately 5 panels per row  $\times$  2 rows minus overlapping efficiency

26. A carpenter is using a water level to transfer an elevation around the corner of a building. The carpenter fills the tube with water and checks for air bubbles. Why must all air bubbles be removed from the water level tube before taking readings?

- A. Air bubbles cause the water to change colour, making it difficult to read the water level in the clear tube
- B. Air bubbles compress under the weight of the water column and displace the water level at each end, causing false readings — only a continuous, bubble-free water column produces accurate level transfer
- C. Air bubbles create turbulence in the tube that takes hours to settle before accurate readings can be taken

D. Air bubbles react with the plastic tube material and cause the tube to become opaque over time

27. A carpenter is building formwork for a concrete foundation wall and must install the form ties. The ties resist the lateral pressure of the wet concrete and hold the two form panels at the correct spacing. On a 2.4-metre-tall wall being poured at a rate of one metre per hour, where is the concrete pressure greatest?

A. At the bottom of the form where the full hydrostatic head of liquid concrete pushes outward against the form panels — pressure increases linearly with depth

B. At the top of the form where the concrete is most recently placed and has not yet begun to set

C. At the midpoint of the form height where the combination of concrete weight and form panel stiffness creates the maximum bending moment in the panel

D. The pressure is uniform from top to bottom because concrete is a homogeneous material throughout

28. A carpenter is ordering form plywood for a large concrete pour. The specification calls for "B-B Plyform" panels. What is Plyform, and what makes it different from standard construction plywood?

A. Plyform is standard construction plywood that has been stained brown to distinguish it from sheathing

B. Plyform is a lightweight plywood made with foam core layers that reduces the weight of the form panels

C. Plyform is a concrete forming plywood manufactured with waterproof adhesive, smooth sanded faces, and a release agent-compatible surface that resists delamination from exposure to wet concrete

D. Plyform is a fire-rated plywood that prevents the forms from igniting during hot weather concrete pours

29. A carpenter strips the forms from a concrete wall and discovers a large void — an area approximately 300 mm × 200 mm where no concrete is present, exposing the rebar. This is significantly larger than typical honeycombing. What is the most likely cause of this large void?

- A. The rebar spacing was too tight and blocked the concrete flow entirely at that area of the wall form
- B. A form board or debris was left inside the form before the pour, displacing the concrete and creating the void when it was not removed
- C. The form release agent was applied too heavily at that location, preventing the concrete from bonding
- D. The concrete mix was too stiff at the time of placement and could not flow around the rebar at that area

30. A carpenter is placing concrete for a basement wall in two lifts. The first lift is 1.2 metres high and has been vibrated and is beginning to stiffen. The second lift is being placed on top. The carpenter does not vibrate the second lift into the first lift — the vibrator only penetrates the second lift. What problem will this cause?

- A. The second lift will cure faster because it is exposed to more air circulation at the top of the form
- B. The first lift will become stronger because the weight of the second lift compresses it during curing
- C. Both lifts will cure normally because they are the same concrete mix and will bond chemically regardless
- D. A cold joint will form between the lifts — the two layers will not bond properly, creating a horizontal weak plane that can leak water and reduce the wall's structural capacity

31. When a concrete slab is poured monolithically with a turned-down edge (integral footing), the carpenter must form the outer edge of the slab at the footing depth. The footing is wider than the slab above it. How does the carpenter form this transition from the wider footing to the narrower slab?

- A. The carpenter builds the outer edge form at the footing depth and width, with a shelf form (ledge) at the slab elevation that transitions the concrete from the wider footing below to the narrower slab above
- B. The carpenter pours the footing first, then strips the footing forms and builds slab forms on top of it
- C. The carpenter uses two separate edge forms — one for the footing and one for the slab — with a gap between them for the concrete to fill the transition naturally without a formed step
- D. The footing and slab are always the same width in a monolithic pour, so no transition form is needed

32. A carpenter has finished screeding a large concrete slab and must bull float the surface before the bleed water appears. The slab is 15 metres wide — too wide to reach the centre with a standard bull float handle. What tool is used to float the surface of a large slab?

- A. A power trowel (helicopter) is used immediately after screeding to float the wide slab in a single pass
- B. A hand-held magnesium float on an extended handle is thrown across the surface like a disc to smooth it
- C. A long-handle magnesium or aluminum bull float on extension handles, or a highway float (a large float pulled by ropes from opposite sides), is used to reach the centre of the wide slab
- D. No floating is needed on large slabs because the screeding operation alone produces an adequate surface

33. A concrete specification calls for 28-day cylinder break tests to verify the concrete strength. The carpenter knows that test cylinders are cast from each concrete truck and cured under standard conditions. When the 28-day test result for a specific area of the building comes back below the specified strength, what action is typically required?

- A. The entire section of concrete represented by the failed test must be demolished and repoured immediately
- B. The structural engineer evaluates the test results to determine if the below-strength concrete is adequate for the applied loads — this may involve additional testing (core samples from the structure), analysis, or localized repairs
- C. The concrete supplier pays a financial penalty but no physical action is taken on the installed concrete
- D. Additional cylinder tests are performed at 56 days because all concrete eventually reaches its specified strength

34. A carpenter is constructing a concrete form for a wall with a stepped footing on a sloped site. At each step, the footing drops to a lower elevation. What is the Building Code requirement for the height of each step in a stepped footing?

- A. Each step must be exactly 200 mm high to match the standard concrete masonry unit course height

B. Each step height can be any dimension as long as the total drop equals the site grade change over the length

C. Each step must be at least 300 mm high to provide adequate depth for the wall reinforcement at each level

D. Each step must not exceed the footing thickness, and the horizontal distance between steps must be at least 600 mm (or twice the footing thickness, whichever is greater) to maintain the structural integrity of the footing

35. A carpenter is finishing a concrete floor slab and wants to achieve a smooth, hard, burnished surface suitable for polished concrete. What finishing technique produces this burnished surface?

A. Multiple passes with a steel trowel at progressively flatter blade angles and increasing pressure, compacting the surface paste layer to produce a hard, dense, burnished finish

B. A single pass with a wooden float followed by immediate application of a curing compound for a smooth finish

C. A broom dragged across the surface at high speed to produce a polished effect on the hardening concrete

D. A power grinder with diamond pads run over the cured surface to mechanically polish the concrete flat

36. A carpenter is building a form for a concrete curb on a parking lot. The curb is 150 mm wide and 200 mm tall with a sloped face (battered face) on the traffic side. How is the sloped face achieved in the formwork?

A. A vertical form is used and the batter is created by hand-sculpting the wet concrete after form stripping

B. The form panel on the traffic side is built at a slight angle to produce the battered face automatically

C. A triangular filler strip (chamfer strip or bevelled form liner) is attached to the inside face of the form panel on the traffic side, creating the sloped profile when the concrete fills around it

D. The curb is poured vertically and then ground at an angle after curing to create the battered face surface

37. A carpenter places concrete for a retaining wall on a Friday afternoon. The weekend forecast calls for temperatures between 15°C and 20°C with no rain. The specification requires wet curing for 7 days. The carpenter applies curing compound on Friday evening before leaving the site. Is this approach acceptable for the weekend curing requirement?

A. No, because curing compound must be reapplied every 24 hours to maintain its effectiveness on the wall

B. No, because wet curing requires physical water application (burlap and water, soaker hoses) and curing compound does not qualify as wet curing under most specifications

C. Yes, because curing compound is equivalent to wet curing and meets the specification requirement fully

D. Yes, but only if the curing compound is a membrane-type product specifically approved for retaining walls

38. When placing concrete in a wall form, the carpenter must work the concrete around electrical conduit and junction boxes embedded in the form. These embedded items create obstacles that can trap air beneath them. How does the carpenter ensure complete consolidation around these embedded items?

A. The carpenter pours the concrete slowly to allow it to flow naturally around the conduit without vibration

B. The carpenter vibrates the concrete thoroughly on all sides of each embedded item, moving the vibrator around the obstruction to expel trapped air from beneath and behind every conduit and box

C. The carpenter taps the outside of the form panels with a rubber mallet at the embedded item locations

D. The carpenter installs small vent tubes behind each embedded item that allow trapped air to escape upward

39. A concrete slab specification calls for the slab to have a "Class B" floor flatness tolerance. The carpenter must check the flatness of the finished slab. At what stage is the flatness measured?

- A. Within 24 to 72 hours after placement, after the concrete has hardened sufficiently to walk on without damaging the surface, and before any construction traffic or subsequent work alters the surface
- B. Immediately after the final trowel pass while the surface is still soft enough to correct any deviations
- C. After the floor covering is installed to verify that the combined slab and flooring assembly meets tolerance
- D. At the 28-day mark when the concrete has reached its full design strength and all shrinkage is complete

40. A carpenter is building forms for an elevated concrete slab (a suspended slab on shores). The forms include plywood deck panels supported by joists, which are supported by stringers, which are supported by shores. This entire assembly is called the formwork falsework system. What is the most critical aspect of this system?

- A. The plywood deck panels must be smooth and defect-free for an architectural finish on the ceiling below
- B. The joists must be spaced to match the rebar layout for consistent concrete cover on the slab soffit
- C. Every component in the load path — from the deck panels through the joists, stringers, and shores to the ground — must be adequate to carry the combined weight of the concrete, reinforcement, formwork, and construction live loads without failure
- D. The shores must be steel rather than timber because timber shores compress under sustained loading

41. A carpenter is vibrating concrete in a deep footing and the vibrator suddenly stops working while still immersed in the concrete. The concrete will begin to set around the vibrator within 30 to 60 minutes. What should the carpenter do?

- A. Continue placing concrete over the immersed vibrator and retrieve it after the forms are stripped
- B. Extract the vibrator immediately by pulling on the cable and shaft before the surrounding concrete stiffens — if the vibrator remains embedded, it creates a void when removed later or becomes a permanent obstruction

C. Leave the vibrator in place because it will be encapsulated by the concrete and will not affect the structure

D. Pour water around the vibrator to slow the concrete setting and give the repair crew time to extract it

42. A carpenter pours a concrete slab in hot weather (35°C with low humidity and a light wind). All of these conditions accelerate surface moisture loss. Despite applying curing compound immediately after finishing, shallow cracks appear within the first three hours. What additional measures should have been taken?

A. The slab should have been poured at night to avoid the daytime heat, wind, and low humidity conditions

B. The curing compound should have been applied in three coats instead of one for triple the protection

C. The sub-base should have been wetted more thoroughly to provide a moisture reservoir beneath the slab

D. Evaporation retarder (a spray-on film applied to the surface between screeding and finishing) should have been used during the finishing process, and windbreaks or shade should have been erected to reduce the rate of surface drying

43. A carpenter is selecting nail size for toe-nailing a wall stud to the bottom plate. Toenailing requires driving the nail at an angle (approximately 30 degrees from the stud face) through the stud into the plate. What nail size is typically used for toe-nailing studs to plates?

A. 82 mm (3-1/4 inch) nails driven at an angle through the stud end and into the plate for adequate penetration into the plate after accounting for the angled path length

B. 57 mm (2-1/4 inch) finishing nails driven at a steep angle for minimal visibility at the stud-to-plate joint

C. 101 mm (4 inch) nails driven straight through the stud end grain into the plate for maximum holding power

D. 63 mm (2-1/2 inch) nails driven at a shallow angle across the face of the stud into the adjacent plate edge

44. A carpenter is framing a wall with a doorway. The rough opening height must accommodate the door unit plus shimming space at the top. A standard pre-hung interior door is 2,032 mm (80 inches) tall. What is the standard rough opening height for this door?

- A. 2,032 mm matching the door height exactly for a friction-fit installation without any shimming space
- B. 2,082 mm providing 50 mm of shimming space above the door frame for adjustment during installation
- C. 2,058 mm providing approximately 25 mm of shimming space above the top of the pre-hung frame
- D. 2,134 mm providing 100 mm of shimming space to accommodate the thickest possible head casing

45. A carpenter is installing a beam that spans an opening in a load-bearing wall. The beam is a triple-ply  $38 \times 286$  mm LVL. Each end of the beam bears on a built-up post assembly within the wall. The minimum bearing length at each post is specified by the engineer. Why is the minimum bearing length critical?

- A. The bearing length determines the number of nails that can be driven through the beam into the post
- B. The bearing length distributes the beam reaction over enough area to prevent the wood fibres from crushing perpendicular to the grain at the concentrated load point
- C. The bearing length determines the fire resistance of the connection between the beam and the post
- D. The bearing length affects the aesthetic appearance of the header where it is visible inside the wall cavity

46. A carpenter discovers that a wall stud has a bow (warp) of 15 mm over its 2.44-metre length. The stud is already installed in a load-bearing wall. The sheathing has not been applied. Should the carpenter replace this stud?

- A. No, because 15 mm over 2.44 metres is within the acceptable tolerance for framing lumber in bearing walls

B. No, because the sheathing and drywall will force the stud straight when applied to both faces of the wall

C. Yes, because any visible bow in a load-bearing wall stud disqualifies it from structural service by code

D. Yes — a 15 mm bow significantly exceeds the typical 6 to 8 mm tolerance and will create a visible bump in the finished wall surface that cannot be corrected with sheathing or drywall

47. When framing a floor system, the carpenter installs bridging between the joists. The Building Code requires bridging when joist depth exceeds a certain ratio to its width. What is this ratio threshold?

A. Bridging is required when the depth-to-width ratio exceeds approximately 6:1 — for a 38 mm wide joist, bridging is required when the depth exceeds approximately 228 mm (which means  $38 \times 235$  mm and larger joists require bridging)

B. Bridging is always required regardless of joist depth-to-width ratio for all floor systems in residential buildings

C. Bridging is required only when the joist span exceeds 4 metres regardless of the joist cross-section size

D. Bridging is never required by the Building Code and is installed only as a sound-dampening measure

48. A carpenter is framing a roof with a Dutch hip — a gable end that has a small hip section at the top. The Dutch hip combines a gable wall with a hip at the upper portion of the roof. What structural benefit does a Dutch hip provide compared to a full gable end?

A. The Dutch hip reduces the total roof area and requires less sheathing material than a full gable design

B. The Dutch hip provides better interior natural lighting through the gable window at the top of the wall

C. The Dutch hip reduces the wind resistance at the gable end because the hip section deflects wind over the top of the roof more effectively than a vertical gable wall, which acts as a flat windward surface

D. The Dutch hip increases the attic ventilation area by creating additional soffit exposure at the hip section

49. A carpenter is framing a wall that will contain a pocket door. The pocket frame is a manufactured assembly that replaces the standard stud framing within the pocket section. The pocket frame uses split studs — thin studs on each side of the pocket cavity. Why do the split studs affect the wall's structural capacity?

- A. Split studs are thinner than standard studs and have less cross-sectional area to carry compressive loads
- B. Split studs cannot be insulated because the pocket cavity between them must remain clear for the door
- C. Split studs cannot accept standard electrical boxes on the pocket side because the box would protrude
- D. Split studs are significantly thinner than standard studs, reducing the wall's ability to carry loads — pocket doors should not be installed in load-bearing walls unless the engineer has designed the wall to accommodate the reduced stud capacity

50. A carpenter is installing subfloor panels and must ensure that the tongue-and-groove joints between panels are tight. Some panels do not pull tight together easily. What tool does the carpenter use to draw the panels tight before fastening?

- A. A pry bar or a purpose-made panel puller tool (such as a panel claw or a temporary cleat nailed to the joist) that levers the panel tight against the adjacent panel's groove before the fasteners are driven
- B. A rubber mallet used to hammer the panel edges directly, driving the tongue into the groove by impact
- C. A bottle jack placed between the panel edge and a temporary block to push the panel into alignment
- D. A pipe clamp spanning from the far wall to the panel edge that pulls the panel across the subfloor

51. A carpenter is framing a wall and must install a corner where an interior partition wall meets an exterior wall at a T-intersection. The carpenter needs to provide a nailing surface for the drywall at the inside corner of the T-intersection. What framing method provides this nailing surface?

- A. An extra stud is installed in the exterior wall at the intersection, turned flat (38 mm face) to provide a nailing edge

B. A metal drywall clip is attached to the end stud of the partition, eliminating the need for additional framing

C. A ladder block assembly (horizontal blocking between the studs in the exterior wall) at the partition location provides the nailing surface for the intersecting drywall

D. The drywall on the exterior wall side is extended past the corner to wrap around and cover the partition end

52. A carpenter has completed the framing of a floor system and must install the subfloor. The specification calls for 18.5 mm (23/32 inch) tongue-and-groove OSB subfloor panels. The carpenter notices that the stamp on the panels reads "32/16." What does this stamp mean?

A. The panel measures 32 mm thick on one edge and 16 mm thick on the other due to the tongue-and-groove

B. The panel is rated to span 32 inches (812 mm) as roof sheathing or 16 inches (406 mm) as subfloor when supported by framing at those maximum spacings

C. The panel weighs 32 kg per sheet and has a load rating of 16 kN per square metre for floor applications

D. The panel contains 32 layers of wood strand and 16 layers of adhesive in its cross-section composition

53. A carpenter is installing a structural ridge beam (glulam) in a cathedral ceiling. The beam is 130 mm × 532 mm and weighs approximately 30 kg per linear metre. The beam is 8 metres long (total weight approximately 240 kg). The beam must be raised to the ridge height (approximately 4 metres). What method should be used to raise this beam?

A. Four carpenters can lift the beam by hand using stepladders positioned at each quarter-point of the beam

B. The beam is lifted by tying one end to a rope and pulling it up while the other end slides on a temporary ramp

C. The beam is cut into two 4-metre sections, raised separately, and spliced together at the ridge height

D. A crane, telehandler, or mechanical lifting device is used to raise the 240 kg beam safely to the ridge height — manual lifting of this weight at height creates an unacceptable risk of injury

54. A carpenter is framing exterior walls and must select between oriented strand board (OSB) and plywood for structural wall sheathing. Both materials meet the structural sheathing standard. What practical difference between OSB and plywood should the carpenter consider for wall sheathing?

A. OSB is more susceptible to edge swelling when exposed to moisture than plywood — if OSB edges absorb water during construction, they can swell permanently, creating ridges that telegraph through the cladding

B. Plywood is always stronger than OSB in every structural application and should be used exclusively

C. OSB costs three times more than plywood and should only be used when specified by the engineer

D. Plywood cannot be used as structural sheathing for shear walls because it splits along the grain direction

55. When framing a hip roof, the carpenter must cut compound angles on the jack rafters where they meet the hip rafter. These compound angles consist of two simultaneous cuts. What two angles make up the compound cut on a jack rafter?

A. A plumb cut angle (the roof pitch) combined with a level cut angle (horizontal) at the bearing seat

B. A rake angle combined with a twist angle that compensates for the hip rafter's diagonal orientation

C. A plumb cut angle (the roof pitch angle) combined with a side cut angle (a horizontal bevel that accounts for the hip rafter's diagonal position in the roof plane)

D. A square cut combined with a bevel cut that matches the slope of the hip rafter at each intersection

56. A carpenter is installing joist hangers on a flush beam. The specification requires Simpson Strong-Tie LUS28 hangers with 10d × 1-1/2 inch joist hanger nails (3.33 mm diameter × 38 mm long). The carpenter has only standard 10d common nails (3.76 mm diameter × 76 mm long) available. Can these be substituted?

- A. Yes, because the common nails are the same penny size (10d) and therefore have the same capacity
- B. No — common nails are the wrong diameter and length for joist hangers; the longer nails would penetrate through the beam and the different diameter changes the shear capacity per nail from the engineering specification
- C. Yes, because the common nails are thicker and therefore provide better shear resistance per nail location
- D. No, but only because common nails are too thick to fit through the pre-punched holes in the joist hanger

57. A carpenter is framing a wall opening for a large picture window. The opening is 3.0 metres wide in a non-bearing exterior wall. Even though the wall is non-bearing, the carpenter installs a header at the top of the opening. What loads must this header resist in a non-bearing wall?

- A. The header must support the weight of the wall framing above the opening (double top plate, cripple studs, and sheathing) and transfer any minor incidental loads that may be applied, even though it does not carry floor or roof loads
- B. The header can be omitted entirely because non-bearing walls carry no loads of any kind above openings
- C. The header must carry the same loads as a bearing wall header because all exterior walls are load-bearing
- D. The header only resists lateral wind loads and does not carry any vertical loads in a non-bearing wall

58. A carpenter is installing a manufactured truss system on a building. Several trusses have a noticeable upward bow (camber) in the bottom chord when viewed from the end. The trusses appear curved rather than straight. Is this condition acceptable?

- A. No, because any visible camber indicates a manufacturing defect that affects the truss structural capacity
- B. No, because the curved bottom chord will prevent the ceiling drywall from lying flat against the framing
- C. Yes, but only if the camber is less than 5 mm per metre of span for the bottom chord of each truss

D. Yes — manufactured trusses are intentionally built with upward camber (pre-deflection) in the bottom chord to compensate for the deflection that occurs under load, producing a level ceiling after loading

59. A carpenter is building a deck and must select fasteners for attaching the decking boards to the joists. The decking is pressure-treated lumber (ACQ treatment). What type of fastener is required?

A. Standard bright (uncoated) nails or screws because the pressure treatment protects the wood from decay

B. Hot-dipped galvanized or stainless steel fasteners because the copper-based ACQ preservative corrodes standard zinc-plated and uncoated fasteners, causing premature failure and staining

C. Aluminum nails because aluminum does not react with any chemical treatment process used on lumber

D. Brass screws because brass is the only metal that is completely immune to the acids in treated lumber

60. A carpenter is framing an interior load-bearing wall on a second-storey floor system. The wall runs parallel to the floor joists below. Since the wall is parallel to the joists, it sits on only one or two joists. The wall carries significant loads from the roof and third storey above. What framing modification is needed below this wall?

A. No modification is needed because the subfloor distributes the wall loads evenly across all joists below

B. The wall must be repositioned perpendicular to the joists so it bears on multiple joists simultaneously

C. A beam or doubled joists must be installed beneath the bearing wall to carry the concentrated loads to the support points below, because a single joist cannot carry the accumulated bearing wall loads from above

D. Additional subfloor adhesive must be applied beneath the wall to distribute the loads to the adjacent joists

61. A carpenter is installing a pre-hung exterior door in a wall with stucco cladding. The stucco extends to within 10 mm of the door brick mould. How should the joint between the stucco and the brick mould be sealed?

- A. The joint should be left open to allow the stucco to breathe and release moisture from the wall cavity
- B. The joint should be filled with mortar to match the stucco surface for a seamless transition at the door
- C. A bead of paintable exterior caulking should be applied in the joint to seal against water and air penetration while allowing the different materials to move independently
- D. A metal J-bead should be installed in the stucco at the door location to create a mechanical seal joint

62. A carpenter is installing self-adhesive ice and water shield membrane at a roof valley. The membrane must be wide enough to cover the full valley and extend a minimum distance up each roof slope from the valley centreline. What is the typical minimum membrane width for valley application?

- A. 900 mm (36 inches) wide, extending at least 450 mm (18 inches) up each slope from the valley centreline
- B. 600 mm (24 inches) wide, extending at least 300 mm up each slope from the valley centreline
- C. 300 mm (12 inches) wide, extending at least 150 mm up each slope from the valley centreline
- D. The full width of the roof from ridge to eave on both slopes intersecting at the valley location

63. A carpenter finishes applying asphalt shingles and notices that several shingles on the south-facing slope have their adhesive strips exposed — the tab above did not cover the strip on the shingle below. What installation error caused this?

- A. The shingles were installed upside down, with the adhesive strip facing the sky instead of facing downward
- B. The shingle exposure (the visible portion) is set too large, leaving the adhesive strip above the coverage zone

- C. The starter strip at the eave was omitted, throwing off the entire course alignment from the bottom up
- D. The adhesive strips are on the wrong side of the shingle — the manufacturer applied them incorrectly during production

64. A carpenter is installing wood lap siding and must establish a consistent exposure for each course from the bottom of the wall to the soffit. The wall height from the starter strip to the soffit is 2,640 mm. The siding exposure is nominally 150 mm. How does the carpenter adjust the exposure so that full courses reach exactly to the soffit without a narrow sliver at the top?

- A. The carpenter divides the wall height by a whole number of courses that produces an exposure close to but not exceeding the maximum:  $2,640 \div 18 = 146.7$  mm per course, giving 18 even courses
- B. The carpenter uses the nominal 150 mm exposure and cuts the last course at the soffit to fit the remainder
- C. The carpenter increases the overlap on each course by 1 mm to accumulate a reduction that fits the soffit
- D. The carpenter installs the siding from the soffit downward to the starter strip so any partial course is at the base

65. A carpenter is installing an exterior window flashing system using the "back-dam" method at the sill. What is a back dam, and what function does it serve?

- A. A back dam is a small upturned lip at the back edge of the sill flashing that prevents water from migrating inward past the window frame and into the wall cavity
- B. A back dam is a drainage tube installed behind the window frame that channels water to the weep holes
- C. A back dam is a structural bracket that supports the window sill from behind for heavy stone sill applications
- D. A back dam is a foam gasket installed between the window frame and the rough sill for air sealing only

66. A carpenter is installing aluminum soffit panels in a 600 mm wide eave overhang. The soffit runs from the wall to the fascia. The panels are available in 300 mm and 400 mm widths. Which panel width should the carpenter select for this application?

- A. Two 300 mm panels per bay, which equals the exact 600 mm width — this eliminates the need for cutting and produces clean, factory-finished edges at both the wall channel and the fascia channel
- B. One 400 mm panel per bay, trimmed to 600 mm width on site using tin snips for a custom fit
- C. Three 300 mm panels overlapped to span the 600 mm width for triple-layer weather protection
- D. One 300 mm panel centred in the 600 mm bay with the gaps at each side open for ventilation airflow

67. When installing a metal drip edge at the eave of a roof, the vertical face of the drip edge (the fascia flange) should extend a specific distance below the edge of the roof sheathing. What is the purpose of this downward extension?

- A. The downward extension holds the drip edge in place by friction against the fascia board surface
- B. The downward extension is purely decorative and matches the fascia board colour for visual continuity
- C. The downward extension covers the gap between the sheathing edge and the fascia to prevent insects from entering the roof cavity from below the drip edge and sheathing
- D. The downward extension directs water away from the fascia board and into the gutter trough rather than allowing it to run back along the underside of the sheathing by capillary action

68. A carpenter is installing a rain screen wall assembly with 19 mm vertical furring strips over the housewrap. The cladding will be installed on the furring strips. At the base of the wall, the drainage cavity between the cladding and the housewrap must have a termination detail. What is installed at the base?

- A. A solid blocking strip that seals the bottom of the cavity to prevent cold air from entering the wall cavity

B. A perforated metal or plastic starter strip (bug screen) that allows water to drain out and air to enter while blocking insects and rodents from entering the drainage cavity

C. An open gap with no treatment that allows unrestricted drainage and airflow at the base of the wall

D. A foam sill seal that compresses to fill the cavity and absorbs water draining down from the cladding

69. A carpenter is installing exterior window shutters on a brick veneer wall. The shutters will be mounted with masonry anchors driven into the brick. Before drilling into the brick, what must the carpenter verify?

A. That the drill locations are in the brick face (not the mortar joints) to ensure a solid anchor in the dense masonry — and that no utilities run behind the brick at the drilling locations

B. That the shutters are mounted in the mortar joints only, because drilling into the brick face cracks it

C. That the brick veneer is at least 200 mm thick to provide adequate anchor depth for the shutter screws

D. That the shutters match the brick colour within two shades for aesthetic compliance with the design intent

70. A carpenter is installing a continuous metal head flashing above a row of windows on a commercial building. The flashing runs the full length of the window row (approximately 6 metres). Since metal flashing stock is typically available in 3-metre lengths, two pieces must be joined. How should the two pieces be joined?

A. A butt joint with caulking applied between the two pieces for a watertight seal at the junction point

B. A rivet connection with three rivets spaced evenly across the joint overlap for mechanical attachment

C. An overlap joint of at least 75 to 100 mm with the upper piece lapping over the lower piece (the piece closer to the water source) and sealed with sealant to prevent water from penetrating the joint

D. A soldered joint that fuses the two pieces into a continuous watertight strip along the full window length

71. A carpenter is installing cedar shingle siding on a wall that has a horizontal trim board at the transition between the first and second storeys. The trim board has a metal Z-flashing above it. The upper wall shingles start above the flashing. At the bottom of the upper wall section, what special treatment is needed for the first course of shingles above the flashing?

- A. The first course above the flashing is installed with a wider exposure for a visual break at the transition
- B. The first course above the flashing is doubled (two shingles stacked) just like the starter course at the base
- C. The first course above the flashing is installed with a reduced exposure for extra overlap protection
- D. A doubled starter course is installed above the flashing, with the first layer's butts facing upward (like a standard starter course), to provide a solid base and proper tilt for the first visible course of shingles

72. A carpenter is installing an exterior door threshold and must ensure the threshold is properly supported along its full length. The subfloor beneath the threshold must be flat and solid. If the subfloor has a dip beneath the threshold, what problem will this cause?

- A. The threshold will have a visible hump at each end that causes a tripping hazard at the door entry
- B. The threshold will flex under foot traffic at the unsupported dip, eventually cracking the threshold seal and allowing water to penetrate beneath the door and into the subfloor below
- C. The door slab will not close properly because the threshold deflection changes the gap dimension
- D. The weatherstripping at the threshold will wear unevenly, requiring more frequent replacement cycles

73. A carpenter is installing vinyl siding on a gable end and must trim the panels at an angle to follow the roof slope. When cutting vinyl siding in cold weather (below 5°C), what special consideration applies?

- A. Vinyl becomes brittle in cold temperatures and is more likely to crack or shatter when cut with tin snips or a utility knife — the carpenter should use a fine-tooth saw blade that produces a cleaner cut with less stress on the material

- B. Vinyl expands in cold weather and the carpenter must leave wider expansion gaps at all trim terminations
- C. Vinyl siding cannot be installed in cold weather and the work must be postponed until temperatures rise
- D. Cold vinyl siding must be heated with a heat gun before cutting to restore its flexibility for accurate cuts

74. A carpenter is installing a fibreglass entrance door system that includes sidelites (narrow glass panels on each side of the door). The sidelites and door frame must be mullied (joined together) as a unit before installation in the rough opening. What is the primary reason for mulling the components before installation?

- A. Mulling reduces the total cost by combining three separate frames into one for a bulk purchase discount
- B. Mulling creates a wider door assembly that exceeds the minimum egress width required by the Building Code
- C. Mulling joins the door frame and sidelite frames into a single structural and weathertight assembly with sealed joints that prevent water infiltration and air leakage at the frame-to-frame junctions
- D. Mulling allows the door and sidelites to share a single set of hinges for simplified hardware installation

75. A carpenter installs an asphalt shingle roof and must apply the ridge cap shingles over the ridge vent. The ridge cap shingles overlap each other from one end of the ridge to the other. Which end of the ridge does the installation start from?

- A. From the centre of the ridge, working toward both ends simultaneously for a balanced appearance
- B. From either end if the ridge is sheltered, but on exposed ridges, installation starts from the end opposite the prevailing wind
- C. From the end nearest the ladder access point for convenience during the installation process

D. From the end that faces the prevailing wind, with the cap shingles lapping away from the wind so each cap overlaps the one below in the wind direction

76. A carpenter completes a cladding installation and must apply touch-up paint to all nail heads and cut edges on the fibre cement siding. Why is touch-up paint necessary on fibre cement?

- A. Touch-up paint improves the colour consistency between factory-finished and field-cut surfaces only
- B. Touch-up paint seals the exposed raw fibre cement at nail holes and cut edges, preventing moisture absorption that causes swelling, staining, and premature deterioration at unprotected locations
- C. Touch-up paint is required by the manufacturer's warranty only and has no functional benefit to the siding
- D. Touch-up paint prevents UV degradation of the fibre cement binder that occurs at exposed raw surfaces

77. A carpenter is installing drywall on a ceiling and encounters a recessed lighting can (pot light housing) that protrudes below the ceiling framing. The drywall must fit around this cylindrical housing. What is the best method for cutting the circular opening in the drywall?

- A. Use a utility knife to score a square opening slightly larger than the housing and press through the panel
- B. Use a drywall keyhole saw to cut a rough circular opening freehand, slightly oversized for clearance
- C. Use an adjustable drywall circle cutter set to the exact housing diameter for a precise circular cut that allows the trim ring to conceal the edge
- D. Use a reciprocating saw to cut the opening from the back side of the panel for a cleaner face appearance

78. A carpenter installs a pre-hung interior door and discovers that the door will not latch — the latch bolt does not engage the strike plate opening. The latch bolt misses the strike plate opening by approximately 3 mm vertically. What is the simplest correction?

- A. Adjust the strike plate position — either move it 3 mm to align with the latch bolt, or file the strike plate opening to enlarge it so the bolt engages properly
- B. Remove the door from the hinges and trim 3 mm from the hinge edge to lower the door in the frame
- C. Replace the entire lockset with a different brand that has a wider latch bolt throw to reach the strike
- D. Reinstall the complete door frame to correct the 3 mm alignment issue between the jamb and the latch

79. When installing hardwood flooring, the carpenter must leave an expansion gap between the flooring and all walls, door frames, and fixed objects. The typical gap is 10 to 12 mm. After the flooring is installed, what covers this expansion gap at the walls?

- A. A bead of flexible caulking applied in the gap before the baseboard is installed to seal against drafts
- B. The baseboard (and shoe moulding if used) covers the expansion gap while allowing the floor to expand and contract beneath it
- C. A T-molding transition strip installed at the wall perimeter that bridges the gap between the floor and wall
- D. The gap is filled with matching wood filler after the floor has been in place for one full season of movement

80. A carpenter is installing a large format ceramic tile floor (600 × 600 mm tiles). Before beginning the tile layout, the carpenter must verify the subfloor deflection. Large tiles are rigid and will crack if the subfloor deflects excessively. What is the maximum allowable deflection for a subfloor that will receive large ceramic tiles?

- A.  $L/180$  of the joist span — the standard deflection limit for residential floor framing under the Building Code
- B.  $L/360$  of the joist span — a more stringent deflection limit that ensures the subfloor does not flex enough to crack the rigid tiles or break the grout joints
- C.  $L/120$  of the joist span — a relaxed limit that accounts for the tile's rigidity distributing loads over a wider area

D. No maximum deflection is specified because the tile adhesive is flexible enough to accommodate any movement

81. A carpenter is installing baseboard in a room where one wall is noticeably bowed — the centre of the wall curves inward approximately 10 mm. The baseboard must follow this wall contour. How does the carpenter install the baseboard on a bowed wall?

A. The baseboard is installed tight against the wall at the stud locations (using nails at each stud), and the gaps between studs are filled with paintable caulking to create the appearance of a continuous tight fit

B. Additional drywall compound is applied to the bowed area to build it out flush before baseboard installation

C. The baseboard is heated with a heat gun until it becomes flexible enough to conform to the wall contour

D. A thicker baseboard profile is used on the bowed wall that visually masks the 10 mm bow in the surface

82. A carpenter is installing a kitchen countertop that has a sink cutout. Before cutting, the carpenter must position the cutout so it is centred on the base cabinet below. The front edge of the countertop overhangs the cabinet face by 25 mm. If the carpenter positions the sink cutout based on the countertop front edge rather than the cabinet centre, what error results?

A. The sink will be centred on the countertop but offset from the cabinet, causing the plumbing to miss the drain

B. The sink will be positioned too far forward, leaving insufficient countertop material behind the sink

C. The sink cutout will be too far back, offset from the cabinet centre by the 25 mm overhang dimension — the drain may not align with the plumbing below and the sink basin may not fit within the cabinet opening

D. The sink weight will not be supported by the cabinet because the basin hangs past the cabinet front edge

83. When installing crown moulding, the carpenter must determine the correct blade angles on the mitre saw for the specific spring angle of the moulding. For standard 38/52 crown moulding being cut flat on the mitre saw table (not nested), what are the mitre and bevel angles for a standard 90-degree inside corner?

- A. Mitre angle of 45 degrees with no bevel — the standard flat mitre cut used for all inside corners
- B. Mitre angle of 31.6 degrees and bevel angle of 33.9 degrees — these are the compound angles for 38/52 spring angle crown cut flat on the saw table
- C. Mitre angle of 22.5 degrees and bevel angle of 22.5 degrees for standard crown cut flat on the table
- D. Mitre angle of 33.9 degrees and bevel angle of 31.6 degrees — the reversed compound angles for crown

84. A carpenter is installing a pocket door and discovers that the door edge has a slight warp — the leading edge bows inward approximately 3 mm over the door height. When the door is fully retracted in the pocket, this warp causes the door edge to contact the split stud on one side. What is the consequence?

- A. The warped door operates normally because the 3 mm bow is within the manufacturing tolerance standard
- B. The warped door slides with slightly more friction but is functionally acceptable for residential service
- C. The warped door rattles in the pocket because the bow creates an uneven gap between the door and frame
- D. The warped door catches on the split stud during operation, binding as it enters or exits the pocket — the door should be replaced with a flat slab or the warp corrected before installation

85. A carpenter finishes installing hardwood flooring and prepares for the sanding process. The first sanding pass uses a coarse grit (36 to 40 grit) on a drum sander. In what direction must the drum sander move across the floor during this first pass?

- A. Along the length of the floorboards (with the grain) to cut the board surfaces evenly without cross-grain scratches that would show through the finish

B. Across the floorboards (against the grain) to quickly level any height differences between adjacent boards

C. In a diagonal pattern at 45 degrees to the floorboard direction for maximum material removal efficiency

D. In a circular pattern starting from the centre of the room and spiraling outward to the walls for coverage

86. A carpenter is installing a bathroom exhaust fan housing in the ceiling between two joists. The fan housing is wider than the joist spacing. The carpenter must cut into one joist to fit the housing. What framing modification is needed?

A. The fan housing must be relocated to a position where it fits between the joists without cutting any joist

B. A section of the joist is cut, and the cut ends are supported by a header on each side of the opening

C. A smaller exhaust fan must be selected that fits within the existing joist spacing without modification

D. The joist is notched (not cut through) to accept the fan housing while maintaining the joist's structural continuity

87. A carpenter is installing a stairway and must check that the nosing profile meets the Building Code requirements. The Building Code specifies that the nosing must have a specific profile — it cannot be abrupt or have a sharp overhang that catches the toe. What nosing profile satisfies this requirement?

A. A sharp, square 90-degree nosing that projects 25 mm past the riser face below for maximum visibility

B. A rounded or bevelled nosing with a radius or chamfer that eliminates the sharp leading edge, projecting 19 to 32 mm past the riser face — this profile reduces the tripping hazard from toe-catching

C. A flat nosing with no projection past the riser face that creates a flush tread-to-riser transition

D. A reverse-sloped nosing that angles downward past the riser to shed water on exterior stair applications

88. A carpenter is installing laminate floating floor planks and reaches a transition to a hallway that is perpendicular to the plank direction. The flooring must turn the corner into the hallway. Can the carpenter continue the floating floor around the 90-degree corner without a transition strip?

- A. Yes, by cutting planks at 45 degrees to create a mitred transition at the corner for continuous flooring
- B. Yes, by using T-connectors at the corner that join planks running in both directions without a visible strip
- C. Yes, if the corner joint is glued with wood adhesive to prevent movement at the direction-change point
- D. No — a transition strip should be installed at the direction change because the floor needs to expand independently in each direction; continuing around the corner without a break can cause buckling

89. When installing interior trim, the carpenter uses a brad nailer to attach the casing. The brad leaves a small hole approximately 1 mm in diameter on the trim surface. What is the standard practice for concealing these brad holes before painting?

- A. Each hole is filled with a lightweight, non-shrinking wood filler (or painter's putty), allowed to dry, and sanded smooth so the filled hole is invisible after painting
- B. The holes are left unfilled because the primer coat fills them and they disappear after two coats of paint
- C. Each hole is filled with a drop of wood glue that dries clear and matches the trim surface perfectly
- D. The holes are covered with small adhesive patches that are painted over during the finishing process

90. A carpenter installs a pre-hung interior door and closes it to check the fit. The door closes and latches, but the carpenter notices that the door slab touches the stop on the hinge side before it fully contacts the stop on the strike side — the door sits slightly open at the strike side while tight on the hinge side. What is this condition called, and what causes it?

- A. This is called "springing" and is caused by the stop being set too tight on the hinge side of the frame

B. This is called "racking" and is caused by the diagonal dimension of the door being unequal to the frame

C. This is called "binding" and is caused by the door being 3 mm wider than the jamb opening dimension

D. This condition indicates the door is slightly twisted (warped) — the hinge edge and strike edge are not in the same plane, so one corner contacts the stop before the opposite corner

91. A carpenter is renovating a house built in 1960 and discovers that the insulation in the attic is vermiculite — a lightweight, granular mineral that was commonly used as attic insulation in the mid-twentieth century. Why must the carpenter exercise extreme caution with this material?

A. Vermiculite is extremely flammable and any disturbance can cause a fire in the attic space above

B. Vermiculite from certain mines (notably the Libby, Montana mine) is contaminated with asbestos — it must be tested before disturbance, and if asbestos is present, professional abatement is required

C. Vermiculite releases silica dust when disturbed that causes silicosis with prolonged exposure

D. Vermiculite off-gasses formaldehyde when heated, creating a toxic atmosphere in enclosed attic spaces

92. A renovation project involves installing a new beam to replace a bearing wall in an open-concept kitchen-living room conversion. The engineer specifies a  $178 \times 457$  mm ( $7 \times 18$  inch) glulam beam. The existing ceiling height is 2,440 mm (8 feet). After installing the beam with its full depth exposed below the ceiling joists, the clearance beneath the beam would be only 1,983 mm — below the minimum 2,000 mm headroom required by the Building Code. What solution addresses this height issue?

A. The beam can remain at 1,983 mm because the 17 mm shortfall is within the Building Code tolerance

B. The beam is installed with the bottom flush with the ceiling above, and the ceiling joists are notched on top to sit over the beam rather than beside it — this raises the beam into the floor cavity of the storey above

C. A shallower beam is used instead, even though it may not meet the structural requirements of the engineer

D. The beam is recessed into the floor system above — either by increasing the floor depth, or by using a flitch beam (steel plate sandwiched between lumber members) that provides equivalent capacity in a shallower profile, as designed by the engineer

93. A carpenter is renovating a bathroom and must install a new bathtub in a location where the existing floor joists run parallel to the long axis of the tub. The tub, when filled with water and occupied, weighs approximately 500 kg. Only one joist falls beneath the tub. What modification ensures the floor can support the concentrated bathtub load?

A. Additional joists or a support beam must be installed beneath the bathtub location to distribute the 500 kg load across multiple support points, because a single joist may not have adequate capacity for this concentrated load

B. The existing single joist is adequate because residential floor systems are designed for bathtub loads

C. A layer of 19 mm plywood added to the subfloor beneath the tub distributes the load to adjacent joists

D. The tub is repositioned perpendicular to the joists so it bears on multiple joists without modification

94. A renovation involves converting an unheated garage into a heated home office. The existing garage walls have no insulation. The carpenter must insulate the walls to meet current energy code requirements. What additional building envelope component must be installed with the insulation in the exterior walls?

A. A structural sheathing layer on the exterior of the studs to provide racking resistance for the new room

B. A fire-rated drywall layer on the interior to meet the fire separation requirements for the new occupancy

C. An air barrier and vapour retarder (or combined air/vapour barrier) on the warm side of the insulation to control air leakage and moisture migration through the insulated wall assembly

D. A drainage mat on the exterior face of the sheathing to create a rain screen behind the existing cladding

95. A carpenter is replacing a rotted section of floor in a bathroom renovation. The rot extends along three joists for approximately 1.2 metres. After removing the rotted material, the carpenter finds that the joist ends bearing on the beam are still sound. What is the correct repair method?

A. Cut out only the rotted sections of the joists and replace with new wood of the same dimension using screws

B. Sister new joist material alongside the remaining sound sections of the damaged joists, extending at least 600 mm past the end of the rot in each direction, and secure with bolts or structural nails

C. Span the damaged area with plywood patches screwed to the remaining sound portions of each joist

D. Fill the rotted areas with epoxy consolidant and reinstall the subfloor over the chemically stabilized joists

96. During a renovation, a carpenter discovers that the existing house foundation has multiple vertical cracks that appear to follow a pattern — one crack at approximately every 3 metres along the wall. The cracks are narrow (less than 3 mm wide), vertical, and evenly spaced. What is the most likely cause of these cracks?

A. The foundation was poured with defective concrete that has low strength and cracked under normal loads

B. The foundation is settling unevenly on one side due to poor soil conditions beneath the building footing

C. The cracks are the result of seismic activity that damaged the foundation during a past earthquake event

D. The cracks are likely shrinkage cracks that formed during the initial curing of the concrete — they are common, typically non-structural, and occur at regular intervals as the concrete contracts during hydration

97. A carpenter is performing an accessibility renovation and must install a ramp at the front entrance of a house. The entrance is 450 mm above grade. The Building Code requires a maximum ramp slope of 1:12 for accessibility. What is the minimum ramp length needed?

- A. 5,400 mm (5.4 metres) based on the 1:12 ratio:  $450 \text{ mm rise} \times 12 = 5,400 \text{ mm}$  of horizontal run
- B. 2,700 mm based on using a 1:6 ratio instead of the required 1:12 for the accessibility ramp slope
- C. 450 mm based on using the rise as the run for a 1:1 ramp slope with a very steep incline to the door
- D. 10,800 mm based on using a 1:24 ratio that is double the required slope for an extra-gentle incline

98. A carpenter is renovating a century home and must install modern insulation in the exterior walls. The walls are balloon-framed with continuous stud cavities from the sill plate to the attic. Before insulating, what must the carpenter install at every floor level?

- A. Vapour barriers at each floor level to prevent moisture from migrating between storeys in the wall cavities
- B. Sound insulation at each floor level to reduce noise transmission between floors through the wall cavities
- C. Fire stopping at every floor level to block the continuous vertical cavities that would allow fire to spread rapidly from the basement to the attic through the unobstructed stud bays
- D. Pest screening at each floor level to prevent rodents from traveling through the wall cavities between floors

99. A carpenter is renovating a commercial space and must install blocking for wall-mounted hand dryers in a public washroom. The hand dryers are electrically powered and mount at a height of 1,200 mm above the finished floor. Each dryer weighs 8 kg and operates with a strong air blower that vibrates during use. What type of blocking does the carpenter install?

- A. A single piece of  $38 \times 89$  mm lumber between the studs at 1,200 mm height for basic mounting support
- B. Solid blocking using  $38 \times 140$  mm or wider lumber securely nailed between the studs, with the blocking positioned to provide mounting points for all four corners of the dryer mounting bracket — the blocking must resist both the static weight and the vibration forces during operation
- C. A plywood backing panel surface-mounted to the face of the drywall at the mounting location
- D. Metal toggle bolts driven through the drywall into the wall cavity for quick installation without blocking

100. A carpenter completes a renovation that required a building permit. All inspections have been completed and approved. The building department issues the final inspection approval. What document should the carpenter ensure the homeowner receives from the building department?

- A. A receipt for the permit fees paid at the beginning of the renovation project for the homeowner's records
- B. A copy of the contractor's business licence that was submitted as part of the permit application package
- C. A verbal confirmation from the inspector that the work has passed, with no written documentation needed
- D. The final inspection report or occupancy certificate that formally documents the building department's approval of the completed work — this document is essential for the homeowner's records, insurance, and future property transactions

## Practice Exam 12: Answer Key and Explanations

1. C — Crystalline silica dust from cutting fibre cement board causes silicosis — a progressive, irreversible, and potentially fatal lung disease that develops from cumulative exposure. A P100 half-face respirator (or equivalent) filters 99.97% of airborne particles and is the recommended minimum for sustained cutting operations. A standard nuisance dust mask provides inadequate protection against silica particles.

2. A — Before using any pneumatic nailer after storage, the carpenter must inspect it for damage, verify all safety devices function (trigger lock engages, contact trip operates, exhaust port is clear), and confirm the driver and magazine are clean. A malfunctioning safety device can cause accidental discharge that drives a nail into the carpenter or a coworker.

3. D — A missing guardrail at 4 metres above grade is an imminent fall hazard. The carpenter must stop work immediately, prevent anyone from approaching the unguarded edge, and report the condition to the supervisor for immediate guardrail reinstallation. Continuing to work near an unguarded edge — even at a distance — is unacceptable because workers can trip, slip, or be bumped toward the edge.

4. B — Wet conditions provide a direct path for electrical current to flow through the carpenter's body to ground if the drill develops an insulation fault or short circuit. A GFCI detects the leakage current (as little as 5 milliamps) and cuts power within milliseconds — fast enough to prevent electrocution. All outdoor and wet-location power tool use requires GFCI protection.

5. A — Maximum platform load = area  $\times$  rating = 35 sq ft  $\times$  50 psf = 1,750 pounds (approximately 795 kg). This maximum includes everything on the platform — workers, tools, and materials. At 66 pounds per bundle, the carpenter could place approximately 20 bundles on the platform if no workers or tools were present, but must deduct worker and tool weight from the total.

6. C — The riving knife prevents the cut pieces from closing on the back of the blade, which causes kickback. The anti-kickback pawls catch the workpiece if it begins to ride up on the blade. The blade guard covers the exposed blade to prevent hand contact. Removing all three devices simultaneously creates the most dangerous possible table saw configuration.

7. D — If the cartridge power is too high for the concrete thickness, the fastener can penetrate completely through the concrete and exit as a projectile on the opposite side or below. This can injure or kill workers on the other side of the wall, below the floor, or in an adjacent space. Always check the concrete thickness and select the lowest effective power level.

8. B — An unsecured table saw that shifts during a rip cut changes the blade-to-fence alignment while the workpiece is in the cut. This can cause the material to bind between the blade and the shifted fence, resulting in kickback. The shifting blade can also contact the operator's hand if the saw moves toward them. The saw must be clamped or bolted to the work surface.

9. A — Crane operations create a hazard zone that extends beyond the direct swing path because loads can swing, shift, or fall if rigging fails or wind gusts affect the load. The carpenter must maintain awareness of the crane and load position, stay outside the marked exclusion zone, and obey all signal person directions. A falling precast panel can be fatal at any distance within its potential path.

10. C — A bowed piece placed concave-side-down on the mitre saw table rocks on the two high points at each end. When the blade engages, the downward cutting force can suddenly flatten the material, pinching the blade. The material can then spring back, kicking sideways or throwing the off-cut. Bowed material should be placed with the bow facing down (convex side up) or flattened before cutting.

11. D — The fundamental rule of hand tool safety is to never place any body part in the path of a cutting tool. The free hand must always be positioned behind or beside the cutting direction — never in front of or in line with the chisel, knife, or saw blade. If the tool slips, it travels in the cutting direction and strikes whatever is in its path.

12. B — Sawdust is highly combustible — it ignites easily from a cigarette, match, or spark. Adhesive containers may emit flammable vapours. OSB panels are combustible construction materials. A cigarette or match in this environment can ignite the sawdust, which burns rapidly and spreads to the adhesive and panel materials, creating a fast-moving fire.

13. A — "Typ." means "typical" — the noted dimension or detail applies at all similar locations throughout the building unless specifically noted otherwise at a particular location. This shorthand avoids repeating the same dimension at every anchor bolt location on the drawing. If a specific location requires a different spacing, a unique dimension overrides the typical note.

14. C — Diagonal =  $\sqrt{(18.0^2 + 12.0^2)} = \sqrt{(324 + 144)} = \sqrt{468} = 21.63$  metres. Both diagonals must measure 21.63 metres for the rectangle to be square. If the diagonals differ, the layout is out of square and must be adjusted before foundation work proceeds.

15. D — Each pier volume =  $0.4 \times 0.4 \times 2.0 = 0.32$  m<sup>3</sup>. Total for 8 piers =  $0.32 \times 8 = 2.56$  m<sup>3</sup>. Always convert millimetres to metres before calculating volume. Using millimetres produces a result in cubic millimetres that must be divided by 1,000,000,000 to convert to cubic metres — a common and costly error.

16. B — "EPS" stands for "Expanded Polystyrene" — a rigid foam insulation board commonly used on foundation walls below grade. EPS is moisture-resistant, provides continuous insulation without thermal bridging, and is available in various thicknesses and compressive strengths. It is one of the most common foundation insulation materials in Canadian construction.

17. A — Hidden (dashed) lines on a floor plan represent elements above the plan cut that are not directly visible at the floor level — typically beams, headers, soffits, or skylights. The carpenter must account for these overhead elements during framing because they affect ceiling heights, duct routing, and structural load paths.

18. C — Each long wall is 15.0 m. Panels are 1.22 m wide, installed vertically. Panels per wall =  $15.0 \div 1.22 \approx 12.3$  panels. Each panel joint creates one vertical joint, so approximately 11 to 12 joints per long

wall. Two long walls = approximately 22 to 24 vertical joints. This count is needed to estimate the total length of sheathing tape required.

19. B — A 20 mm difference over a 15.25-metre diagonal is approximately 0.13% — well within normal residential construction tolerance. The carpenter should split the difference when setting the sill plate, centering the framing on the foundation so each side absorbs approximately 10 mm of the variance. This produces the least visible deviation from square.

20. D — Total rise = upper elevation – lower elevation = 101.700 – 99.000 = 2.700 metres (2,700 mm). This is measured from finished floor to finished floor — both surfaces that the user's feet contact. This total rise determines the number of risers and the individual riser height for the stairway design.

21. D — Arc length = circumference  $\times$  (angle  $\div$  360) =  $(2\pi \times 3.0) \times (90 \div 360) = (2 \times 3.14 \times 3.0) \times 0.25 = 18.85 \times 0.25 = 4.71$  metres. This calculation determines the length of the curved wall plate and the amount of flexible or kerfed material needed to form the curve. The arc length formula is essential for curved wall construction.

22. B — If the bubble moves to a different position when the level is rotated 180 degrees on the same surface, the level vial is not centred relative to the level body — the instrument is out of calibration. A calibrated level produces the same bubble position regardless of which end faces which direction. The level must be adjusted (if adjustable) or replaced.

23. A — Rod reading = HI – required elevation = 104.200 – 103.450 = 0.750 m. When the rod person places the grade rod on a surface at the correct elevation and the instrument operator reads 0.750 m through the telescope, the surface is confirmed at the target elevation of 103.450 m. A higher reading means the surface is too low; a lower reading means too high.

24. C — Splitting the 12 mm difference between opposite walls distributes the variance so each wall absorbs approximately 6 mm. This minimizes the visible deviation at any single point — a 6 mm offset at each corner is far less noticeable than a 12 mm offset concentrated at one corner. The walls should be laid out as square as possible within the subfloor constraints.

25. D — Room ceiling =  $4.5 \times 6.0 = 27.0$  m<sup>2</sup>. Panel size =  $1.22 \times 3.66 = 4.47$  m<sup>2</sup>. Sheets =  $27.0 \div 4.47 = 6.04$  sheets. However, practical layout requires approximately 5 panels: panels run 3.66 m across the 4.5 m width (two rows with cutting), and 6.0 m length requires approximately 5 panels per row. The actual count depends on the specific layout orientation.

26. B — Air bubbles in a water level tube are compressible — they compress and expand with changes in the water column height, displacing the water surface at each end. This displacement produces false level readings. Only a continuous, unbroken water column transmits hydrostatic pressure accurately, ensuring both ends are at the same elevation.

27. A — Concrete pressure on the form panels is greatest at the bottom of the form where the full depth (head) of liquid concrete pushes outward. Pressure increases linearly with depth — at the bottom of a 2.4-metre wall, the lateral pressure is at its maximum. Form ties and walers must be spaced closer together at the bottom of the form than at the top.

28. C — Plyform is a specialty plywood manufactured specifically for concrete forming. It uses waterproof adhesive (Type I bond) that resists delamination from repeated wet-dry cycles, smooth sanded faces that produce a clean concrete surface, and a surface compatible with form release agents. Standard construction plywood may delaminate after one or two pours.

29. B — A large void with exposed rebar is typically caused by a foreign object left inside the form — a piece of scrap lumber, a forgotten tool, or debris that blocked the concrete flow at that location. The object displaced the concrete and created a void when the forms were stripped. Thorough form cleaning before each pour prevents this defect.

30. D — Without penetrating the vibrator into the top of the first lift, the two lifts remain as separate layers that do not bond at the interface. This creates a cold joint — a horizontal weak plane that can leak water, reduce the wall's shear capacity, and create a visible line on the concrete surface. The vibrator must penetrate 150 mm into the previous lift.

31. A — A monolithic slab with a turned-down edge transitions from a wider footing below to a narrower slab above. The carpenter builds the outer edge form at the footing depth and width, then installs a shelf form (ledge board) at the slab elevation that creates the step between the wider footing and the narrower slab. The concrete fills both sections in a single pour.

32. C — A long-handle magnesium or aluminum bull float on extension handles reaches across wide slabs from the edge. For very wide slabs (beyond bull float reach), a highway float — a large flat float pulled across the surface by ropes from workers on opposite sides — is used. These tools smooth the surface and embed the aggregate without the operator walking on the fresh concrete.

33. B — Below-strength cylinder test results require a structural engineer's evaluation. The engineer may determine that the actual in-place concrete strength (which can differ from cylinder strength due to different curing conditions) is adequate by ordering core samples from the structure for direct testing. The engineer decides whether the concrete can remain or must be repaired.

34. D — The Building Code requires that each step in a stepped footing not exceed the footing thickness in height, and the horizontal distance between steps must be at least 600 mm (or two times the footing thickness, whichever is greater). These rules ensure that the step does not create a weak plane that could shear under the wall loads above.

35. A — A burnished finish is produced by multiple trowelling passes with the trowel blade at progressively flatter angles and increasing pressure. Each pass compacts the surface paste layer further, producing a progressively harder, denser, and smoother surface. The final pass with the blade nearly flat produces the hard, glass-like burnished finish suitable for polished concrete.

36. C — The battered face of a concrete curb is created by attaching a triangular filler strip (chamfer strip or bevelled form liner) to the inside face of the form panel on the traffic side. When concrete fills the form, it flows around the triangular strip, and when the form is stripped, the angled surface of the curb is revealed.

37. B — Most specifications define "wet curing" as maintaining the concrete surface in a continuously wet condition using burlap and water, soaker hoses, or ponding. Curing compounds form a moisture-retaining membrane but do not add water to the surface. If the specification calls for wet curing, a curing compound alone typically does not satisfy the requirement.

38. B — Embedded conduit and junction boxes create obstacles that trap air beneath and behind them. The carpenter must vibrate thoroughly on all sides of each embedded item, moving the vibrator around the obstruction to expel trapped air from every concealed face. Without thorough vibration around these items, voids form that weaken the wall and may expose the conduit.

39. A — Floor flatness measurements are taken after the concrete has hardened enough to walk on without damaging the surface — typically within 24 to 72 hours of placement. Measuring too early damages the surface; measuring after construction traffic has begun may show wear rather than original flatness. The measurement must occur before any subsequent work alters the surface.

40. C — Every component in the formwork falsework system — from the deck panels through the joists, stringers, and shores to the ground bearing — must be adequate for the combined loads: wet concrete weight, reinforcement weight, formwork weight, and construction live loads (workers, equipment, impact). A failure at any point in the load path causes progressive collapse.

41. B — A vibrator embedded in setting concrete must be extracted immediately before the concrete stiffens around it. If left in place, the vibrator becomes permanently embedded — creating a void when eventually broken free, or remaining as an obstruction that interferes with the reinforcement and structural integrity. Extraction becomes impossible within 30 to 60 minutes.

42. D — In hot, windy, low-humidity conditions, an evaporation retarder should have been sprayed on the surface during the finishing process (between screeding and trowelling) to reduce the rate of surface moisture loss. Windbreaks and shade structures further reduce evaporation. Curing compound alone, applied after finishing, cannot prevent plastic shrinkage cracks that form during finishing.

43. A — Toenailing requires 82 mm (3-1/4 inch) nails driven at approximately 30 degrees through the stud into the plate. The angled path through the wood is longer than the straight thickness of the stud, so a longer nail is needed to achieve adequate penetration into the plate. Typically three nails are driven — two on one side and one on the opposite side.

44. C — The standard rough opening height for a pre-hung interior door is approximately 2,058 mm — the door frame height (approximately 2,032 mm plus the head jamb) plus approximately 25 mm of shimming space above the frame for levelling and adjustment. This allows the carpenter to shim and level the head jamb within the rough opening.

45. B — The minimum bearing length distributes the concentrated beam reaction force over enough wood area to keep the compressive stress perpendicular to the grain below the crushing strength of the wood. Too short a bearing concentrates the load on a small area, crushing the wood fibres and allowing the beam to settle into the post.

46. D — A 15 mm bow over 2.44 metres significantly exceeds the typical 6 to 8 mm tolerance for framing lumber. The bow creates a visible bump in the finished wall surface that sheathing and drywall cannot correct — they follow the stud contour. The bowed stud must be replaced with a straight one or planed to remove the bow before sheathing.

47. A — The Building Code requires bridging when the joist depth-to-width ratio exceeds approximately 6:1. For a 38 mm wide joist:  $38 \times 6 = 228$  mm. Joists 235 mm deep and larger (2×10, 2×12) exceed this ratio and require bridging. The bridging prevents the deep, narrow joists from twisting or buckling laterally under load.

48. C — The Dutch hip reduces wind resistance at the gable end by replacing the vertical gable wall at the top with a sloped hip section. A vertical gable wall acts as a flat windward surface that catches the full force of the wind. The hip section deflects wind over the top of the roof, significantly reducing the wind load on the end of the building.

49. D — Split studs in a pocket door frame are significantly thinner than standard studs — typically 19 to 25 mm versus 38 mm. This reduced cross-section has less load-carrying capacity. Pocket doors should not be installed in load-bearing walls unless the wall is specifically designed by the engineer to accommodate the reduced stud capacity.

50. A — A pry bar, panel claw, or a temporary cleat nailed to the joist provides a lever point to push or pull the panel tightly against the adjacent panel. The tongue must seat fully in the groove before the panel is fastened. Using a rubber mallet directly on the tongue risks damaging it; a protective block should always be used between the mallet and the panel edge.

51. C — A ladder block assembly consists of horizontal blocking pieces installed between the studs in the exterior wall at the partition intersection height. The blocking provides a flat nailing surface for the drywall at the T-intersection. This is the most common method for providing interior drywall backing at wall intersections.

52. B — The "32/16" stamp is the panel's span rating under CSA O325 or APA standards. It means the panel can span 32 inches (812 mm) maximum between supports when used as roof sheathing, or 16 inches (406 mm) maximum when used as subfloor. The first number is always the roof span rating and the second is the floor span rating.

53. D — A 240 kg beam at 4 metres height is far too heavy for manual lifting on ladders. A crane, telehandler, or mechanical lifting device must be used to raise the beam safely. Manual lifting of heavy objects at height creates extreme risk of crushing injuries, falls from height, and musculoskeletal damage.

54. A — OSB is more susceptible to edge swelling than plywood when exposed to moisture. If OSB panel edges absorb water during construction delays (rain, snow), the edges swell permanently and create ridges at the panel joints. These ridges telegraph through flexible cladding materials (vinyl siding, thin stucco). Protecting OSB edges during construction is essential.

55. C — The compound cut on a jack rafter consists of two simultaneous angles: a plumb cut angle (determined by the roof pitch) and a side cut angle (a horizontal bevel that accounts for the hip rafter's 45-degree diagonal position in the roof plane). Both angles must be cut simultaneously to produce a face that sits flat against the hip rafter.

56. B — Joist hanger nails are specifically engineered — their diameter (3.33 mm) and length (38 mm) match the connector manufacturer's tested capacity. Standard common nails have a different diameter (3.76 mm) and are too long (76 mm), which means they would penetrate through the beam. The different diameter also changes the shear capacity per nail from the engineering specification.

57. A — Even in a non-bearing wall, the header must support the weight of the wall framing above the opening — the double top plate, cripple studs, sheathing, and any minor incidental loads. A 3.0-metre opening in an exterior wall also requires the header to resist lateral loads from wind. A flat 2×4 is typically adequate for a non-bearing header.

58. D — Manufactured trusses are intentionally built with upward camber (pre-deflection) in the bottom chord. When the truss is loaded (roofing materials, snow, ceiling drywall), the bottom chord deflects downward by the amount of the built-in camber, producing a level ceiling. Without camber, the loaded truss would sag below level.

59. B — ACQ and CA pressure treatments contain copper compounds that are highly corrosive to standard zinc-plated and uncoated steel fasteners. Hot-dipped galvanized or stainless steel fasteners resist this corrosion, maintaining their holding power and preventing the dark rust staining that corroded fasteners produce on treated wood surfaces.

60. C — A bearing wall running parallel to the floor joists concentrates its loads on only the one or two joists directly beneath it. A single joist cannot carry the accumulated roof and floor loads from a bearing wall above. A beam or doubled joists must be installed beneath the bearing wall to carry the concentrated loads to the supporting beams or foundation below.

61. C — A bead of paintable exterior caulking seals the joint between the stucco and the brick mould against water infiltration and air leakage. The caulking must remain flexible to accommodate differential movement between the stucco (rigid, bonded to the wall) and the door frame (which expands and contracts with temperature). Mortar is too rigid for this application.

62. A — Valley ice and water shield membrane is typically 900 mm (36 inches) wide, extending at least 450 mm (18 inches) up each slope from the valley centreline. This width ensures that water flowing down the valley — even when backed up by ice dams — cannot reach the unprotected sheathing beyond the membrane edge.

63. D — The shingle exposure is set too large — each shingle course does not overlap the course below far enough to cover the adhesive strip. This means the adhesive strip is exposed to sunlight (which degrades it) and weather rather than being protected beneath the overlapping tab. Correcting the exposure brings the tab coverage over the adhesive strip.

64. A — The carpenter calculates the number of full courses that fit the wall height:  $2,640 \div 150 = 17.6$  courses. Since 17.6 is not a whole number, the carpenter adjusts to 18 courses:  $2,640 \div 18 = 146.7$  mm per course. This even distribution produces 18 courses with consistent exposure that reach exactly to the soffit.

65. A — A back dam is a small upturned lip (typically 6 to 12 mm high) at the back edge of the sill flashing membrane. If water penetrates past the window frame and reaches the sill flashing, the back dam prevents it from migrating further inward past the window and into the wall cavity. The water is contained on the sill and directed outward through the weep holes.

66. A — Two 300 mm panels per bay exactly fill the 600 mm overhang width without any cutting. This produces clean, factory-finished edges at both the wall channel and the fascia channel. Using factory edges (rather than field-cut edges) produces a more professional appearance and better fit in the receiving channels.

67. D — The downward extension of the drip edge fascia flange directs water away from the fascia board and into the gutter. Without this extension, water running down the underside of the roof sheathing (by capillary action or wind-driven rain) would continue along the sheathing underside, drip onto the fascia, and potentially enter the wall cavity at the eave.

68. B — A perforated metal or plastic starter strip (bug screen) at the base of the rain screen cavity allows water to drain out by gravity and air to enter for ventilation while blocking insects and rodents from entering the drainage cavity. A completely open gap invites pest entry, while a sealed gap prevents drainage — the perforated strip balances all three requirements.

69. A — The carpenter must drill into the brick face (not the mortar joints) for the strongest anchor. Mortar is softer than brick and provides less holding power. Before drilling, the carpenter must verify that no electrical wiring, plumbing, or other utilities run behind the brick at the drilling locations, especially near windows where services are commonly routed.

70. C — Metal head flashing pieces are joined with an overlap of at least 75 to 100 mm, with the upper piece (the piece further from the water source, or the piece on the uphill side) lapping over the lower piece. Sealant is applied between the overlapping surfaces. This follows the fundamental water-shedding principle — water flows over the upper piece and onto the lower piece.

71. D — A doubled starter course above the flashing provides the same function as the doubled starter course at the base of the wall — it tilts the first visible course outward for proper water shedding and provides a solid, gap-free base behind the first visible course. Without this doubled starter, the joints in the first course may allow water behind the shingles.

72. B — A threshold over an unsupported dip flexes downward under foot traffic, repeatedly compressing and releasing the door seal. This cycling eventually cracks the seal material, breaks the adhesive bond, and creates gaps that allow water and air to penetrate beneath the door. Water reaching the subfloor causes rot and structural damage at the door location.

73. A — Vinyl becomes brittle at low temperatures (below approximately 5°C) and is prone to cracking or shattering when cut with tin snips or a utility knife. A fine-tooth saw blade (on a mitre saw or circular saw) produces a cleaner cut with less stress on the material. Hand-operated tools that flex the vinyl during cutting are most likely to cause cracking.

74. C — Mulling creates a single weathertight assembly from the door frame and sidelite frames. The joints between frames are sealed against water and air infiltration using the manufacturer's mulling hardware and sealant. Without proper mulling, the frame-to-frame joints are vulnerable to water penetration and air leakage that compromise the building envelope.

75. D — Ridge cap shingles are installed starting from the end that faces the prevailing wind, working toward the opposite end. Each cap shingle laps over the one before it, with the exposed edge facing away from the prevailing wind. This orientation prevents wind from lifting the exposed cap edges and driving rain beneath them.

76. B — Touch-up paint seals the exposed raw fibre cement at nail holes and cut edges. Unprotected raw fibre cement absorbs moisture, which causes the material to swell at the edges, develop efflorescence staining on the surface, and deteriorate faster than the factory-finished surfaces. The touch-up paint restores the moisture barrier at every field modification point.

77. C — An adjustable drywall circle cutter produces a precise circular cut at the exact diameter of the recessed lighting housing. The trim ring that accompanies the light fixture is designed to cover a small gap around the housing, so the cut must be accurately sized. A keyhole saw produces rough edges that may exceed the trim ring's coverage.

78. A — A 3 mm vertical misalignment between the latch bolt and the strike plate is most easily corrected by moving the strike plate 3 mm to align with the bolt, or by filing the strike plate opening to enlarge it. This is a minor adjustment that does not require rehinging or reframing. The strike plate has slotted screw holes that facilitate vertical adjustment.

79. B — The baseboard and shoe moulding cover the expansion gap at the walls. The baseboard is nailed to the wall studs (not the floor), and the shoe moulding is nailed into the flooring. This arrangement allows the floor to expand and contract freely beneath the baseboard while the shoe moves with the floor, maintaining a tight visual line.

80. B — Large format ceramic tiles are rigid and will crack if the subfloor deflects excessively. The maximum allowable deflection for a tile substrate is  $L/360$  of the joist span — twice as stringent as the  $L/180$  standard for residential floors. If the existing floor exceeds  $L/360$ , the joists must be stiffened or an additional layer of subfloor added.

81. A — For a minor wall bow (10 mm), the baseboard is nailed to the studs and the resulting gaps between studs are filled with paintable caulking. The caulking creates the visual appearance of a continuous tight fit. This is standard practice — perfectly flat walls are rare, and caulking is the finish carpenter's primary tool for concealing minor irregularities.

82. C — If the carpenter measures the sink cutout from the countertop front edge rather than the cabinet centre, the cutout is offset by the 25 mm overhang. The sink basin may not align with the drain plumbing below, and the basin may not fit within the cabinet opening. All sink cutout measurements must reference the cabinet structure, not the countertop edge.

83. B — For 38/52 spring angle crown moulding cut flat on the saw table, the compound mitre angle is 31.6 degrees and the bevel angle is 33.9 degrees. These angles are specific to the 38/52 spring angle and produce accurate mitre joints at standard 90-degree inside and outside corners. Different spring angles require different compound angle settings.

84. D — A 3 mm warp in a pocket door slab causes the bowed edge to contact the split stud on one side as the door slides in and out of the pocket. The door binds at the contact point, making it difficult to open and close smoothly. The door slab must be flat (within 1–2 mm tolerance) for reliable pocket door operation.

85. A — The first (coarse grit) sanding pass must run along the length of the floorboards — with the grain. Sanding across the grain creates deep scratches in the wood surface that are extremely difficult to remove with finer grits and will show through the finish. All sanding passes should follow the grain direction for the smoothest possible result.

86. B — If the fan housing is wider than the joist spacing, a section of joist must be cut to accommodate the housing. The cut joist ends are supported by headers on each side of the fan opening, similar to framing a floor opening. The headers transfer the interrupted joist loads to the adjacent uncut joists on each side.

87. B — The Building Code requires a nosing profile that is rounded or bevelled to eliminate the sharp leading edge that can catch the toe during ascent. The nosing must project 19 to 32 mm past the riser face below. A sharp 90-degree nosing creates a tripping hazard; a profile with no projection eliminates the visual step definition.

88. D — Floating laminate flooring must expand independently in each direction. Continuing the floor around a 90-degree corner without a transition strip creates a locked joint that prevents independent expansion in the two perpendicular directions. When the floor expands, the locked corner resists movement and the planks buckle.

89. A — Each brad hole is filled with lightweight, non-shrinking wood filler (or painter's putty), allowed to dry, and sanded smooth. After priming and painting, the filled holes are invisible. This is standard finish carpentry practice — every fastener hole in painted trim is filled and sanded before the paint crew begins their work.

90. C — A door that contacts the stop on the hinge side before the strike side indicates the door slab is twisted — one corner is displaced forward or backward relative to the other corners. The hinge edge and strike edge are not in the same plane. Minor twist can be corrected by shimming the hinges; severe twist requires door replacement.

91. B — Vermiculite insulation from the Libby, Montana mine (marketed as "Zonolite") was contaminated with tremolite asbestos. The majority of vermiculite insulation installed in North American homes from the 1920s to the 1990s came from this mine. Testing before disturbance is essential — if asbestos is confirmed, professional abatement under controlled conditions is mandatory.

92. D — The beam must be recessed into the floor system above to maintain the required 2,000 mm minimum headroom. This can be achieved by increasing the floor depth to accommodate the beam within the floor cavity, or by using a flitch beam (steel plate sandwiched between shallower lumber members) that provides equivalent structural capacity in a reduced overall depth, as designed by the engineer.

93. A — A single joist may not have adequate capacity for the 500 kg concentrated load of a filled bathtub. Additional joists or a support beam must be installed beneath the tub to distribute the load across multiple support points. The structural modification must be designed based on the specific joist size, spacing, and span relative to the concentrated tub load.

94. C — Insulated walls require an air barrier and vapour retarder on the warm side of the insulation to prevent warm, humid interior air from migrating through the wall and condensing on cold surfaces within the wall cavity. Without these barriers, condensation causes mould growth, wood rot, and insulation degradation that defeats the purpose of the insulation.

95. B — Sister joists are installed alongside the damaged sections, extending at least 600 mm (24 inches) past the end of the rot in each direction. The sisters are bolted or structurally nailed to the existing sound wood, creating a composite member that restores the bending and shear capacity at the damaged location.

96. D — Evenly spaced, narrow vertical cracks at approximately 3-metre intervals are characteristic of concrete shrinkage cracks that form during the initial curing. As the concrete hydrates, it shrinks, and the tensile stresses relieve themselves at regular intervals as cracks. These cracks are common, typically non-structural, and can be sealed with epoxy or polyurethane injection if waterproofing is required.

97. A — Ramp length = rise  $\times$  slope ratio = 450 mm  $\times$  12 = 5,400 mm (5.4 metres). A 1:12 slope means 12 units of horizontal run for every 1 unit of rise. This is the maximum slope permitted by the Building Code for an accessible ramp. Landings are required at the top and bottom, and at every 9-metre interval on longer ramps.

98. C — Balloon framing creates continuous vertical cavities from the sill plate to the attic. Fire stopping must be installed at every floor level and ceiling level to block these vertical pathways. Without fire stopping, a fire in the basement can travel undetected through the stud cavities to the attic in minutes, bypassing all intermediate floors.

99. B — Solid blocking using 38  $\times$  140 mm or wider lumber provides the rigid, concentrated support needed for wall-mounted hand dryers that vibrate during operation. The blocking must be at the correct height and positioned to provide mounting points for all four corners of the dryer bracket. Standard drywall or light blocking cannot resist the vibration-induced pull-out forces.

100. D — The final inspection report or occupancy certificate formally documents the building department's approval that all work complies with the approved drawings and current Building Code. This document is essential for the homeowner's records, property insurance (which may require proof of permitted work), and future property transactions (buyers and their lawyers verify permitted renovations).