PRACTICE EXAM 21: RED SEAL CARPENTER INTERPROVINCIAL SIMULATION (100 QUESTIONS)

1. A carpenter is operating a table saw and notices that the rip fence is not parallel to the blade — the rear of the fence is 2 mm closer to the blade than the front. This misalignment is called "toe-in." What specific hazard does a toed-in fence create during a rip cut?

A. The toed-in fence produces a wider kerf than the blade teeth because the wood is forced sideways into the blade

B. The toed-in fence pinches the workpiece between the fence and the back of the blade, causing the rising rear teeth to grab the wood and throw it back at the operator in a violent kickback

C. The toed-in fence causes the blade to overheat because the trapped wood increases friction on the side teeth

D. The toed-in fence produces a curved cut because the wood follows the angled fence rather than the blade path

2. A carpenter is working on a residential construction site and discovers a small child (approximately 3 years old) wandering into the construction zone from the neighbouring property. The site has open excavations, exposed nails, and operating equipment. What is the carpenter's immediate responsibility?

A. Continue working because the child's parents are responsible for supervising their child at all times nearby

B. Shout a warning to the child to leave the site and return to the neighbouring property immediately

C. Notify the site supervisor at the end of the day about the child trespassing so the fence can be improved

D. Stop work immediately, safely guide the child away from all hazards, secure them with a responsible adult, and report the incident to the site supervisor — the construction zone must be secured to prevent re-entry

3. A carpenter is using a laser level to establish a horizontal reference line inside a building. A coworker walks through the laser beam path. Can a construction laser beam cause eye damage?

A. Yes — even Class 2 or Class 3R construction lasers can cause eye damage with prolonged direct exposure to the beam; workers must never look directly into the laser source, and warning signs should be posted in the laser work area

B. No, all construction-grade lasers are eye-safe and produce beams that cannot damage the human eye

C. Only red lasers can cause eye damage because the red wavelength carries more energy than green lasers

D. Laser eye damage only occurs with industrial cutting lasers, not with the low-power levels used on construction

4. A scaffold erected on a public sidewalk requires a canopy (covered walkway) beneath it to protect pedestrians. The canopy is made from plywood panels supported by a steel frame. What load must this canopy be designed to resist?

A. Only the weight of pedestrians who may lean on the canopy railing during construction delays on the site

B. Only the wind load that acts on the canopy surface from passing traffic and natural wind on the sidewalk

C. The impact load from tools, materials, and debris that may fall from the scaffold platform above — the canopy must withstand these falling objects without collapsing onto the pedestrians walking beneath it

D. Only the weight of accumulated rain water and snow that collects on the canopy surface during weather

5. A carpenter is cutting a large piece of granite countertop with a wet saw (a diamond-blade saw with water cooling). The water system runs dry during the cut and the carpenter continues cutting without water. What two immediate hazards does dry cutting granite create?

A. The granite produces toxic fumes from thermal decomposition when cut without water cooling on surface

B. Dry cutting produces airborne crystalline silica dust that causes silicosis, and the uncontrolled blade overheats rapidly — water suppresses 90%+ of the dust and keeps the blade cool; dry cutting without respiratory protection and water is extremely hazardous

C. The granite changes colour permanently when cut dry because the heat discolours the natural stone surface

D. The diamond blade produces sparks when cutting granite without water that can ignite nearby combustibles

6. A carpenter is securing a load of dimensional lumber to a trailer with ratchet straps. After tightening the first strap, the carpenter notices that the ratchet mechanism does not lock — the handle springs back when released. What is wrong, and why is this dangerous?

A. The strap webbing has stretched beyond its rated capacity and must be replaced with a new rated strap

B. The ratchet pawl is disengaged and the handle needs to be pumped several more times to engage the lock

C. The strap is threaded backward through the ratchet mechanism and must be re-threaded for proper function

D. The ratchet pawl spring is broken or the locking mechanism is damaged — the strap cannot hold tension and the load will shift during transport; the strap must be replaced immediately with a functioning ratchet

7. A carpenter encounters a situation where two different safety regulations appear to conflict — the provincial OHS regulation and the project-specific safety plan have different requirements for the same task. Which regulation takes precedence?

A. The more stringent requirement always applies — the carpenter must follow whichever regulation provides the greater level of protection, and when in doubt, must consult the site safety officer for clarification

B. The project-specific safety plan always supersedes provincial regulations on the contractor's own job site

C. The provincial OHS regulation is the minimum and the contractor can reduce requirements if justified

D. The carpenter chooses which regulation to follow based on their own risk assessment of the specific task

8. A carpenter is installing a temporary wooden guardrail on the edge of an elevated floor platform. The top rail is a single 38 × 89 mm (2 × 4) board spanning 2.4 metres between posts. When the carpenter leans against the rail to test it, the board flexes noticeably. What does this flexibility indicate about the guardrail's adequacy?

A. The flexibility is normal for a temporary guardrail because it only needs to alert workers of the edge location

B. The flexibility is acceptable because the board's material is still intact and has not cracked under the load

C. The single 38 × 89 mm board spanning 2.4 metres is inadequate — it cannot resist the required 900 N point load at mid-span without excessive deflection; the rail must be upgraded to a stronger member (doubled board, deeper lumber, or closer post spacing)

D. The flexibility meets the standard because temporary guardrails have lower strength requirements than permanent guards in buildings

9. A carpenter discovers that the job site first aid attendant's certificate expired two weeks ago. The attendant is the only person on site with first aid training. Work continues with multiple trades present. What must happen before work continues?

A. Work can continue because the attendant's skills do not expire with the certificate and they can still provide aid

B. A valid first aid attendant must be present on site before work continues — OHS regulations require a certified attendant on construction sites with multiple workers; the expired certificate must be renewed or another certified person must be assigned

C. The site supervisor can designate any experienced worker as a temporary first aid attendant until renewal

D. Work can continue if a hospital is within 30 minutes of the job site because professional aid is accessible

10. A carpenter is applying spray-on polyurethane adhesive (from an aerosol can) to bond rigid foam insulation panels to a concrete wall. The aerosol propellant is flammable. The carpenter is working near a gas-fired furnace that has an intermittent pilot light. What is the immediate fire and explosion risk?

A. The polyurethane adhesive itself is the fire hazard because it ignites spontaneously at room temperature

B. The aerosol can may explode from the radiant heat of the furnace even when the adhesive is not being sprayed

C. The flammable propellant is lighter than air and rises to the ceiling where it dissipates before reaching the flame

D. The flammable aerosol propellant disperses at ground level and can travel to the furnace pilot light — if the vapour concentration reaches the lower explosive limit at the flame source, an explosion or flash fire occurs

11. A carpenter is erecting a wall section and needs help from a coworker to raise the framed wall. Before lifting, the two carpenters must coordinate the lift. What is the safest way to lift and raise a framed wall section?

A. Both carpenters position themselves on the same side at each end of the wall, lift together on an agreed verbal count, walk the wall up to vertical using a hand-over-hand technique, and brace it immediately — clear communication of the lift timing and a pre-planned bracing sequence prevent the wall from falling in either direction

B. One carpenter lifts while the other pushes from below using a long 2×4 as a pike pole for the leverage

C. The strongest carpenter lifts the wall alone while the other holds the temporary brace ready for attachment

D. Both carpenters lift from the centre of the wall simultaneously and walk sideways to bring it upright

12. A carpenter is operating a portable generator and connects multiple extension cords to power various tools across the job site. The generator's 20-amp breaker has not tripped, but the carpenter notices that one extension cord is warm to the touch along its entire length. What does a warm extension cord indicate?

A. The cord is absorbing radiant heat from the sun and the temperature is within normal operating range

B. The cord has been in contact with a hot surface and the insulation is melting at the contact location only

C. The cord is carrying current near its maximum rated capacity — the electrical resistance of the wire converts excess current to heat; a warm cord is approaching its limit and continued loading risks melting the insulation, starting a fire, or causing a voltage drop that damages connected tools

D. The cord is defective and has an internal short circuit that generates heat between the two conductors

13. A carpenter is reading a roof plan that shows dashed lines running diagonally from two corners of a rectangular building to the ridge line. These dashed lines represent the hip lines. The plan also shows a shorter dashed line running from where a smaller roof meets the main roof downward to the wall below. What does this shorter dashed line represent?

A. A structural beam within the roof that supports the intersecting roof loads at the valley junction point

B. A gutter downspout route that carries rainwater from the valley intersection to the ground level below

C. A ridge extension from the smaller roof that continues past the main roof ridge for ventilation at that point

D. A valley line — the intersection where the lower roof plane meets the main roof plane, creating a channel that collects and directs water downward from both adjoining roof surfaces

14. A carpenter must calculate the quantity of stair stringers needed for a stairway that is 1,100 mm wide. The Building Code requires that stringers be spaced no more than 750 mm apart for 38 mm (2×) treads. How many stringers are needed?

A. Three stringers — one at each side and one at the centre; the two spans of 550 mm each (1,100 ÷ 2) are well within the 750 mm maximum for 38 mm treads

B. Two stringers (one at each side) with a span of 1,100 mm between them, exceeding the 750 mm maximum

C. Four stringers spaced at 367 mm apart for extra support beyond the code minimum for 38 mm lumber

D. One stringer at the centre with the treads cantilevered 550 mm to each side wall for balanced support

15. A carpenter is estimating the linear metres of baseboard needed for a house. One room measures 4.2 m × 3.6 m with one doorway (900 mm wide). What is the net baseboard length for this room?

A. 15.6 metres based on the room perimeter only without subtracting the doorway opening width from total

B. 7.8 metres based on calculating only two walls instead of the full perimeter of the room for the baseboard

C. 14.7 metres — room perimeter = 2(4.2 + 3.6) = 15.6 m, minus the doorway width of 0.9 m = 14.7 metres of net baseboard

D. 12.0 metres based on subtracting the doorway width from each wall segment adjacent to the opening

16. A carpenter is using a transit to establish a building line. After setting up the transit over a known point and levelling it, the carpenter sights to a reference point 50 metres away. Before taking measurements, the carpenter must verify the instrument is properly calibrated. What field check verifies the transit's horizontal accuracy?

A. Sight to the reference point, lock the horizontal clamp, transit the telescope (flip it 180 degrees vertically), and sight to the same point in the reversed position — if the crosshair does not return to the same point, the instrument has a horizontal collimation error

B. Take readings at three different distances and average them to determine the instrument's accuracy range

C. Set up a second transit at the reference point and verify that both instruments sight the same target location

D. Rotate the instrument 360 degrees and verify that the bubble returns to exactly the centre of the spirit vial

17. A carpenter is reading a structural drawing that specifies a "W200 × 46" steel beam. What information does this designation provide about the beam?

A. The beam is 200 mm wide and 46 mm thick for a rectangular solid steel bar member in the structure

B. The beam weighs 200 kg and spans 46 feet between the support columns in the structural bay layout

C. The beam has a 200 mm deep web with a 46 mm thick flange for the I-shaped steel cross-section profile

D. The beam is a W-shape (wide flange) approximately 200 mm deep and weighing 46 kg per metre of length — this standard designation identifies the beam size for the carpenter to provide correct clearances in the framing

18. A carpenter is performing layout for a building on a sloped site. The front corners are established at elevation 100.000 m. The rear of the building must be excavated 1.5 metres below the front. What elevation must the rear corners be at?

A. 98.500 m — the rear corner elevation = front elevation minus the excavation depth: 100.000 − 1.500 = 98.500 m

B. 101.500 m because the rear must be 1.5 metres higher than the front for proper drainage away from the building

C. 100.000 m because all four corners of the building pad must be at the same elevation regardless of grade

D. 99.250 m based on splitting the 1.5-metre difference between the front and rear corners for an average

19. When a carpenter encounters the abbreviation "CJ" on a concrete floor plan, what does it typically indicate?

A. "Column Joint" — the junction where a concrete column meets the floor slab at that specific plan location

B. "Caulked Joint" — a joint that must be sealed with caulking after the concrete has fully cured in the floor

C. "Control Joint" — a predetermined groove or saw cut in the concrete slab that directs shrinkage cracking to a planned, straight line rather than allowing random uncontrolled cracking across the floor surface

D. "Construction Joint" — the location where two separate concrete pours meet at the planned stopping point

20. A carpenter must calculate the total board footage of lumber for a material order. The order includes 50 pieces of 2 × 10 × 16 feet. One board foot = 1 inch × 12 inches × 12 inches (or the equivalent). What is the formula for board feet per piece, and what is the total?

A. Board feet per piece = (1 × 10 × 16) ÷ 12 = 13.3 bf; total = 50 × 13.3 = 665 board feet for the full order

B. Board feet per piece = (2 × 10 × 16) ÷ 12 = 26.67 bf; total = 50 × 26.67 = 1,333 board feet — the formula uses the nominal dimensions (thickness × width × length) divided by 12

C. Board feet per piece = (2 × 10 × 16) ÷ 144 = 2.22 bf; total = 50 × 2.22 = 111 board feet for the order

D. Board feet per piece = (2 × 10) ÷ 12 × 16 = 2.67 bf; total = 50 × 2.67 = 133 board feet for the order

21. A carpenter is laying out stud positions on a wall plate and encounters a location where a plumbing vent stack will pass through the wall. The vent stack is 75 mm in diameter. The studs are 38 × 140 mm (2 × 6) at 400 mm on centre. Can the vent stack pass through a stud, or must the carpenter frame around it?

A. The vent stack can pass through a single stud because the maximum hole diameter in a 2 × 6 stud is 56 mm

B. The 75 mm hole exceeds the maximum allowable diameter for a 2 × 6 stud (approximately 56 mm = 40% of 140 mm); the carpenter must install blocking between studs and route the vent stack through the clear space between them

C. The vent stack can pass through a 2 × 6 stud because 75 mm is less than half the stud depth of 140 mm

D. The vent must be rerouted to a non-bearing wall because plumbing vents cannot penetrate any bearing stud

22. A carpenter is using a builder's level to shoot grades for a parking lot. From a single setup, the carpenter takes readings at 15 different locations across the lot. The maximum sighting distance is 45 metres. At this long distance, what natural phenomenon can introduce error into the rod readings?

A. Earth's curvature and atmospheric refraction affect the line of sight over long distances — at 45 metres, the combined effect introduces an error of approximately 0.1 to 0.2 mm, which is negligible for parking lot grading but becomes significant at distances beyond 100 metres

B. Wind deflection of the levelling rod at 45 metres changes the apparent rod reading by up to 5 mm per gust

C. Temperature expansion of the metal levelling rod at 45 metres adds 3 mm to every reading on warm days

D. Magnetic interference from underground utilities deflects the instrument's crosshair at long sighting distances

23. A carpenter is estimating the amount of rigid foam insulation needed for a cathedral ceiling. The ceiling has two sloped sections: the main section is 8.0 m × 12.0 m and a dormer section is 3.0 m × 4.0 m. Both sections are at a 6/12 pitch with a slope factor of 1.118. What is the total insulation area needed?

A. 96.0 square metres based on using the plan area only without applying the slope factor for the ceiling pitch

B. 108.0 square metres based on adding the plan areas without applying the slope factor for either section

C. 120.9 square metres based on applying the slope factor to the main section only and not the dormer area

D. 121.3 square metres — main section plan area (8.0 × 12.0 = 96.0 m²) plus dormer (3.0 × 4.0 = 12.0 m²) = 108.0 m² total plan area × 1.118 slope factor = 120.7 m² (approximately 121 m²)

24. A carpenter is reading a window schedule and encounters the entry: "W-05: 1800 × 1200, FX/AW." What does "FX/AW" indicate about this window configuration?

A. The window type is "Full Exterior / All Weather" rated for exposure to extreme climate conditions

B. The window has two sections: the left section is "Fixed" (non-operable) and the right section is "Awning" (hinged at the top and swings outward from the bottom)

C. The window frame is "Fiberglass Exterior" with an "Aluminum Weather-strip" seal at the sash perimeter

D. The window has "Factory Exterior" glazing and "Argon Welded" sealed unit for thermal performance

25. A carpenter needs to determine the slope angle of a 4/12 pitch roof in degrees for setting a bevel gauge. Using arctan(rise/run), what is the angle?

A. 4.0 degrees based on using only the rise value directly as the slope angle without the arctangent formula

B. 26.6 degrees based on using arctan(4/12) but rounding to the nearest 5 degrees for the bevel setting

C. 18.4 degrees based on arctan(4/12) = arctan(0.333) ≈ 18.4 degrees from the horizontal reference plane

D. 33.7 degrees based on using arctan(12/4) instead of arctan(4/12) for the inverse pitch angle calculation

26. A carpenter is performing a material takeoff for floor framing. The floor plan shows a rectangular building 14.0 m × 10.0 m. Floor joists span the 10.0-metre dimension at 400 mm on centre. The joists require a centre beam (flush beam) at mid-span, creating two joist spans of 5.0 metres each. How many joist pieces are needed (each side of the beam has its own set of joists)?

A. 72 joist pieces — each side needs (14,000 ÷ 400) + 1 = 36 joists; two sides = 36 × 2 = 72 joist pieces total

B. 36 joist pieces based on calculating only one side of the beam without doubling for both joist spans

C. 70 joist pieces based on (14,000 ÷ 400) = 35 joists per side × 2 = 70 without adding the starter joist

D. 108 joist pieces based on tripling the one-side count for an incorrect three-span floor system calculation

27. A carpenter is building formwork for a concrete wall that will be backfilled on one side. The structural drawing specifies that the wall must have a "roughened surface" at the top where a second pour will later be placed for the wall above. How does the carpenter create a roughened surface on the top of the first pour?

A. The carpenter grooves the top surface with a broom while the concrete is plastic, creating a rough texture

B. The carpenter blasts the cured surface with a pressure washer after form stripping to expose the aggregate

C. The carpenter applies a chemical retarder to the top before it sets, then washes off the loose paste later

D. Before the concrete fully hardens, the carpenter rakes or scarifies the top surface to a depth of approximately 6 mm using a rake, broom, or roughening tool — this creates a rough profile that provides mechanical bond for the subsequent concrete pour

28. A concrete specification calls for "air-entrained concrete" for all exterior slabs but specifically states "non-air-entrained" for interior structural columns. Why is air entrainment excluded from the column concrete?

A. Air-entrained concrete is more expensive than non-air-entrained and the cost savings justify the exclusion

B. Air entrainment reduces compressive strength — each 1% of entrained air reduces strength by approximately 5%, and structural columns require maximum compressive capacity; since interior columns are not exposed to freeze-thaw cycles, the strength reduction from air is an unnecessary penalty

C. Air bubbles in columns cause the reinforcing steel to corrode faster from the oxygen trapped in the voids

D. Air-entrained concrete cannot be vibrated effectively in the narrow column forms because the bubbles expand

29. A carpenter is constructing forms for a concrete wall with a 90-degree corner. At the corner, the two form panels meet. The carpenter must ensure that the corner produces a clean, sharp concrete edge. What detail at the inside corner of the form prevents concrete leakage and produces a clean joint?

A. A bead of expanding foam sprayed into the corner gap between the form panels before the pour begins

B. A strip of rubber gasket glued along the form panel edges at the corner before they are joined together

C. The form panels are clamped tightly together with the edges butted flush — additionally, a chamfer strip or a foam backer rod is placed in the corner to seal the joint and produce a clean bevelled edge on the concrete

D. The corner gap is left open because the concrete paste naturally seals the gap during the first minutes of pour

30. When placing concrete for a slab-on-grade, the carpenter monitors the concrete level using a laser level. The laser receiver on the grade rod shows the concrete is 8 mm above the target elevation at one screed point. What must the carpenter do?

A. Remove concrete at the high point by pulling it away with a rake or shovel until the screed bar reaches the correct elevation at that location — concrete that is too high must be removed, not pushed down, because compressing the surface creates a dense layer over a loose subsurface

B. Vibrate the high point to compact the concrete down by 8 mm to the correct elevation at the screed line

C. Leave the high point because the 8 mm will settle naturally as the concrete shrinks during the curing phase

D. Add extra concrete at the adjacent low areas to blend the surface level with the high point for consistency

31. A carpenter is building forms for a concrete wall and must install "snap ties" to maintain the correct wall thickness. Snap ties are steel rods that pass through both form panels and hold them at the correct spacing. After the forms are stripped, the snap tie ends are visible on the concrete surface. How are the tie ends treated after stripping?

A. The tie ends are left protruding from the wall surface because they are flush with the form panel face

B. The tie ends are covered with stucco or parging during the exterior finishing phase for weather protection

C. The tie ends are ground flush with the wall surface using an angle grinder to remove any protrusions

D. The snap tie is designed to break off at a predetermined point below the concrete surface — the recessed break point is then patched with non-shrink grout or a polymer-modified cementitious patch to seal the hole and protect the embedded steel from corrosion

32. A carpenter is placing concrete for a large commercial slab and the specification requires "laser screed" finishing. What is a laser screed, and how does it differ from traditional screeding?

A. A laser screed uses a laser pointer to show the carpenter where to place the screed bar for traditional hand pull

B. A laser screed is a machine-operated screeding system that uses a laser-guided boom to spread, level, and compact concrete automatically — the machine follows the laser reference plane to produce a flat, consistent slab surface that meets tight flatness tolerances over large areas that would be difficult to achieve by hand

C. A laser screed is a hand-held laser level that the carpenter uses to check the slab elevation after traditional screeding

D. A laser screed cuts control joints into the concrete using a laser-guided saw that follows programmed patterns

33. A carpenter is vibrating concrete in a deep column form (4.0 metres tall, 500 × 500 mm cross-section). The concrete is placed in 450 mm lifts. After placing and vibrating the sixth lift, the carpenter inserts the vibrator and it penetrates easily — much more easily than in the previous lifts. What does this easy penetration indicate?

A. The vibrator head has become smaller from wear during the six lifts and passes through the concrete easily

B. The sixth lift has a higher slump than the previous lifts because the concrete supplier changed the mix design

C. The sixth lift concrete has bonded perfectly with the lift below and the seamless connection allows easy vibrator passage through both lifts simultaneously

D. The previous lift may have begun to set and is no longer responding to the vibrator — alternatively, the current lift may have excess water content; either condition requires investigation because a stiff lower lift may create a cold joint

34. When a concrete specification calls for "Type HE cement," what property does this cement type provide?

A. "High Early" strength — Type HE cement develops strength more rapidly than Type GU (General Use), allowing faster form stripping, earlier loading of the structure, and shorter construction schedules in time-sensitive projects

B. "High Endurance" — this cement resists chemical attack from industrial floor cleaning compounds

C. "Heat Elimination" — this cement generates no heat during hydration for sensitive temperature applications

D. "Humidity Engineered" — this cement is specifically formulated for placement in high-humidity environments

35. A carpenter is finishing a concrete slab for a commercial building and the specification calls for "F-number flatness and levelness" testing. The specification states FF 35 / FL 25 as the minimum floor flatness and levelness values. What do these F-numbers measure?

A. FF measures the foundation footing depth and FL measures the floor level relative to the building benchmark

B. FF measures the fire rating of the floor assembly and FL measures the floor load capacity in kilonewtons

C. FF measures the surface flatness and FL measures the floor finish quality for aesthetic appearance ratings

D. FF (Floor Flatness) measures the local bumpiness of the surface over short distances, and FL (Floor Levelness) measures the overall slope or tilt of the floor over longer distances — higher numbers indicate flatter and more level floors

36. A carpenter is building a form for a concrete grade beam that has a "haunch" — a wider, deeper section at each end where the beam connects to the pile caps. The haunch transitions from the standard beam section to a wider bearing section over a sloped distance. How is this haunch formed?

A. The haunch is formed by pouring the beam in two separate pours — the wide base first, then the standard section

B. The form panel on each side flares outward at the haunch location, following the haunch profile — the side panels are cut to the haunch shape (wider at the bottom, narrowing to the standard width over the transition length), and the soffit widens correspondingly

C. The haunch is created after stripping by chipping the concrete to the wider profile at each beam end area

D. A precast concrete block is placed at each end and the cast-in-place beam concrete bonds to it monolithically

37. A carpenter is placing concrete for a retaining wall on a hot day (32°C). The specification requires that the concrete temperature at placement not exceed 30°C. The concrete arrives at 33°C. What options does the carpenter have?

A. The carpenter can use ice as part of the batch water to lower the mix temperature, request that the batch plant add ice or chilled water to the next loads, or use liquid nitrogen injection at the truck to cool the concrete below the 30°C maximum before placement

B. Adding 20 litres of cold water per cubic metre of concrete reduces the temperature by 3°C without effect

C. Spraying the exterior of the truck drum with water cools the concrete inside by 5°C within 15 minutes

D. The 3°C overage is within normal tolerance and the concrete can be placed without any temperature adjustment

38. When a carpenter builds a concrete form, "form ties" hold the two opposing panels at the correct spacing. There are several types of form ties: snap ties, she-bolts, taper ties, and coil ties. What characteristic is common to all types of form ties?

A. All form ties are permanent components that remain embedded in the concrete wall after stripping forever

B. All form ties are made from aluminum to prevent rust staining on the exposed concrete surface after strip

C. All form ties resist the lateral concrete pressure that pushes the form panels outward by acting in tension across the wall thickness — the tie rod transfers the pressure from one panel through the concrete to the opposite panel

D. All form ties must be removed completely from the concrete after stripping to prevent corrosion inside the wall

39. A carpenter is finishing a concrete floor slab and must create a "hard trowel" finish. The carpenter performs multiple trowelling passes. Between passes, the carpenter waits for the concrete to stiffen further. With each successive pass, the trowel blade angle changes. How does the blade angle progress through the passes?

A. The blade starts nearly flat and is raised to a steeper angle with each successive pass for lighter contact

B. The blade starts at a moderate angle (approximately 10 to 15 degrees) and is progressively flattened with each successive pass — flatter blade angles apply more pressure to the surface, producing a denser, harder, smoother finish with each pass

C. The blade angle remains constant at 45 degrees throughout all passes for consistent surface compaction

D. The blade starts at a steep angle and maintains that angle because the stiffening concrete requires equal force

40. A carpenter is constructing forms for a concrete slab that will receive a polished concrete finish. The specification requires that the concrete have a minimum compressive strength of 35 MPa and a maximum aggregate size of 19 mm. The concrete also contains integral colour pigment to produce a uniform buff tone. What additional forming requirement applies to coloured concrete?

A. The forms must be assembled from new plywood panels only because reused panels may contaminate colour

B. The form release agent must be a clear, non-staining type that does not affect the concrete colour at all edges

C. The forms must be double-faced with an interior liner that produces a glass-smooth surface for polishing

D. The forms and all placement procedures must be consistent throughout the entire pour — the same form material, the same release agent application method, and the same placement rate must be maintained to avoid colour variations between areas; any inconsistency in forming or placement can produce visible colour differences in the finished polished surface

41. A carpenter is building forms for a concrete foundation wall and the drawings show "horizontal reinforcement" consisting of two continuous bars at the top of the wall and two at the bottom, with vertical bars at 400 mm on centre. Before the concrete is placed, the building inspector checks the "concrete cover" — the distance between the rebar and the nearest form face. The minimum cover for a foundation wall cast against earth is 75 mm. Why is the cover at the earth face greater than the cover at the interior face?

A. The earth-face rebar is larger diameter and requires more concrete around it for adequate bond development

B. The earth face receives more vibration during placement and the rebar must be further from the panel surface

C. Greater cover is required for aesthetic purposes because the earth face is visible during construction only

D. The earth face is exposed to soil moisture, chemicals, and potential abrasion from backfill — the thicker concrete cover provides greater protection for the embedded steel against corrosion, which is accelerated by sustained contact with soil moisture and aggressive soil chemistry

42. A carpenter is placing concrete for a residential basement slab. After screeding and bull floating, the carpenter notices that the bleed water is not appearing as expected — the surface looks dry almost immediately. This is unusual because the previous slab from the same mix design produced normal bleed water. What could cause this "zero-bleed" condition, and why is it a concern?

A. The granular base beneath the slab is extremely dry and is absorbing the water from the bottom of the concrete

B. The zero-bleed condition may be caused by the granular base absorbing water from the concrete bottom or by an air content that is higher than specified — the concern is that the surface will dry and stiffen rapidly, reducing the finishing window and increasing the risk of plastic shrinkage cracking

C. The concrete supplier added too much cement to the mix, which absorbs all the water during rapid hydration

D. The vapour barrier beneath the slab is preventing moisture from entering the concrete from the ground below

43. A carpenter is framing a floor system and the engineer specifies "joist hangers with SDS screws" for the flush beam connections. The designation "SDS" refers to a specific type of structural screw. What are SDS screws, and why are they specified instead of standard joist hanger nails?

A. SDS screws are standard drywall screws used as a cost-effective alternative to joist hanger nails for savings

B. SDS screws are self-drilling structural screws that cannot be used in joist hangers and the spec is an error

C. SDS (Simpson Strong-Drive) screws are structural wood screws that provide higher shear capacity per fastener than standard joist hanger nails — fewer SDS screws can achieve the same connection capacity as more nails, and they install faster with a standard drill

D. SDS screws are stainless steel deck screws used in exterior joist hangers for corrosion resistance on decks

44. When framing a hip roof, the carpenter installs "hip jack rafters" that run from the wall plate to the hip rafter. Each successive hip jack is shorter than the previous one as they approach the building corner. The length difference between adjacent jack rafters is constant. This constant is called the "common

difference." If the rafter spacing is 400 mm on centre and the roof pitch is 8/12, what determines the common difference?

A. The common difference equals the rafter spacing multiplied by the unit line length for a common rafter at the given pitch, divided by 12 — for 8/12 pitch: common unit line length = 14.42 in/ft; common difference = (400 mm converted to feet) × 14.42 ÷ 12

B. The common difference equals the hip rafter unit length multiplied by the building perimeter for the roof area

C. The common difference equals the building width divided by the total number of jack rafters on each hip side

D. The common difference is always 400 mm regardless of the pitch because it equals the rafter spacing directly

45. A carpenter is framing a wall that will contain a pocket door. The pocket frame is a manufactured steel split-stud assembly. The carpenter discovers that the wall is load-bearing. The pocket frame manufacturer states that their product is for non-bearing walls only. What must the carpenter do?

A. Install the pocket frame regardless because the double top plate distributes the loads around the pocket area

B. Reinforce the pocket frame with additional studs sistered to each split stud for the extra bearing capacity

C. Replace the pocket door with a barn door (surface-mounted sliding door) that does not require a modified wall

D. Consult the structural engineer for a design that accommodates the pocket door in the bearing wall — this may involve a header system that transfers the loads above the pocket to the full-height studs on each side, bypassing the reduced-capacity split studs entirely

46. A carpenter is installing subfloor panels and reaches a location where a floor joist has a 12 mm bow (crown) while all adjacent joists are straight. The crowned joist creates a high spot in the subfloor. If the subfloor panel is nailed to this joist without correction, what problem results?

A. The subfloor panel rocks on the high joist and does not make contact with the adjacent lower joists nearby

B. The crowned joist creates a visible ridge in the finished floor above — any flooring material (hardwood, tile, or carpet) installed over this ridge shows the bump; the carpenter must plane the crown down to match the adjacent joist tops before the subfloor is applied

C. The high joist only affects the subfloor in wet conditions because moisture causes the panel to conform to it

D. The crowned joist accelerates subfloor panel failure because the elevated nailing point stresses the panel

47. A carpenter is framing a wall with a large cased opening (no door, just a trimmed opening for a passage between rooms). The opening is 2.4 metres wide and 2.1 metres tall in a non-bearing wall. The carpenter installs a flat 2 × 4 header (38 × 89 mm on the flat). Is this adequate for a non-bearing wall opening of this width?

A. No, a flat 2 × 4 cannot span 2.4 metres even in a non-bearing wall because it has virtually no bending capacity

B. Yes, because non-bearing walls carry no loads and even a flat 2 × 4 header is adequate for any span width

C. A flat 2 × 4 can span 2.4 metres in a non-bearing wall because it only supports the weight of the wall framing above the opening (double top plate, cripple studs, and sheathing) — however, the carpenter should verify this with the Building Code tables

D. A flat 2 × 4 is adequate only if doubled (two pieces side by side) for the 2.4-metre span in non-bearing walls

48. When framing a floor system, the carpenter discovers that one manufactured I-joist has arrived with a factory-installed "web hole reinforcer" — a pre-punched metal plate riveted to each side of the web at a specific location. What is the purpose of this factory-installed reinforcer?

A. The manufacturer has pre-installed the reinforcer at a location where a large hole (for HVAC ductwork or plumbing) can be cut in the web — the reinforcer maintains the joist's shear capacity at the weakened hole location

B. The reinforcer is a quality control tag that identifies the joist's production batch for warranty tracking only

C. The reinforcer provides additional web stiffening at the bearing point that replaces the field-installed squash block

D. The reinforcer is a splice plate that joins two shorter web sections into one longer I-joist during production

49. A carpenter is building a deck and the specification requires "post-to-beam" connections using a manufactured metal connector (such as a Simpson PBS44). The connector bolts through the post top and wraps around the beam base. What specific force does this connector resist that a simple beam-on-post bearing connection does not?

A. Simple bearing relies on gravity only — the beam can be knocked off the post by lateral forces from wind or seismic events; the manufactured connector mechanically ties the beam to the post, preventing the beam from displacing laterally or lifting off under wind uplift, seismic, or horizontal deck loads

B. The connector reduces the bearing stress on the post by distributing the load through the metal side plates

C. The connector prevents the beam from twisting on the post under eccentric loading from one-sided joists

D. The connector provides a weather barrier between the beam and post that prevents moisture from wicking

50. A carpenter is framing a gable end wall and must calculate the length of each gable stud. The wall plate is 2.44 metres above the floor (standard wall height). Above the top plate, the gable studs extend to the underside of the rafter. The roof pitch is 6/12 and the studs are at 400 mm on centre. The first gable stud is 400 mm from the building corner. What is its height above the top plate?

A. 400 mm based on using only the stud spacing as the height without applying the pitch ratio for the rise

B. 200 mm based on the stud spacing of 400 mm multiplied by the pitch ratio (6/12 = 0.5): 400 × 0.5 = 200 mm above the top plate

C. 600 mm based on adding the pitch rise (6) to the spacing in some unit for the combined height of the stud

D. 100 mm based on dividing the stud spacing by the pitch denominator: 400 ÷ 12 × 3 for a partial ratio

51. A carpenter is installing a manufactured roof truss system and the truss engineer's drawings show a "piggyback" truss configuration. The top section (cap truss) sits on top of the bottom section (base truss). When are piggyback trusses used instead of single full-height trusses?

A. Piggyback trusses are always used on buildings wider than 12 metres because single trusses cannot span

B. Piggyback trusses are used for aesthetic purposes to create a visible joint line at the cap-to-base transition

C. Piggyback trusses are used when the full-height truss would exceed the maximum transport height for standard truck trailers — splitting the truss into two stackable sections allows delivery on standard-height trailers

D. Piggyback trusses are cheaper to manufacture than single-piece trusses of the same total height and span

52. A carpenter is framing a wall and must install fire blocking at the intersection of a partition wall with an exterior wall. The fire blocking must fill the void at the top of the wall where the partition meets the exterior wall's double top plate. Why is fire blocking required at this specific location?

A. The intersection creates a horizontal channel along the top plate where fire can travel from one stud bay to the next — without fire blocking, fire entering any stud bay can spread horizontally through this channel to adjacent bays and into the attic above

B. The fire blocking at the intersection supports the weight of the partition wall from the double top plate above

C. The fire blocking provides sound isolation between the rooms on each side of the partition wall at the top plate

D. The fire blocking prevents air infiltration at the intersection that would reduce the building's energy performance

53. A carpenter is constructing a cantilevered bay window floor. The cantilevered joists extend 450 mm past the exterior wall. The joists are 38 × 184 mm (2 × 8) at 400 mm on centre. The backspan (from the cantilever to the interior support) is 3.0 metres. The engineer requires that the cantilevered joist ends be "tied down" at the backspan. What prevents the backspan from lifting?

A. The weight of the floor system and interior wall above the backspan prevents the backspan end from lifting

B. The subfloor adhesive and nails connecting the backspan to the adjacent standard joists resist the uplift force

C. The bottom plate of the interior wall sits on top of the backspan and the wall weight provides hold-down force

D. Blocking and structural connections between the cantilevered joists and the floor framing above at the backspan end resist the uplift force — when the cantilever is loaded, the backspan acts as a lever and the far end tends to lift; positive mechanical connection prevents this overturning

54. When framing an exterior wall, the carpenter must decide the stud spacing. The most common spacings are 400 mm (16 inches) and 600 mm (24 inches) on centre. A newer approach called "advanced framing" (or OVE — Optimum Value Engineering) uses 600 mm spacing with single top plates and two-stud corners. What is the primary benefit of advanced framing?

A. Advanced framing costs more than standard framing but provides a stronger wall for seismic resistance

B. Advanced framing reduces the amount of wood in the wall, increasing the cavity space available for insulation — the wider stud spacing and reduced framing at corners and headers decrease thermal bridging through the wood studs

C. Advanced framing is required by the Building Code for all new construction in energy-efficient climate zones

D. Advanced framing eliminates the need for structural sheathing because the wider stud spacing provides more racking resistance from the larger cavity space in the wall

55. A carpenter is installing a structural ridge beam for a cathedral ceiling. The beam is supported by posts at each gable end. The rafters bear on the beam with birdsmouth cuts. In this configuration, the

rafters act as simple beams from the wall plate to the ridge beam. What force is eliminated by using a ridge beam instead of a conventional ridge board with ceiling joists?

A. The outward thrust at the wall plate is eliminated — with a ridge beam, the rafters do not push the walls apart because the beam carries the vertical loads directly through the posts to the foundation; the rafters act as simply supported beams with only vertical reactions at the wall plate

B. The downward force on the foundation is eliminated because the beam transfers roof loads to the gable walls

C. The wind uplift force is eliminated because the heavy beam anchors the roof to the building by its mass

D. The snow load is eliminated because the steep pitch required for a ridge beam sheds all snow automatically

56. A carpenter is framing a wall and must install a fire stop between the first-storey wall cavity and the attic space above. In platform framing, what components automatically provide this fire stopping?

A. The exterior wall sheathing provides fire stopping between the wall and attic because it covers the stud cavity

B. The insulation in the wall cavity provides fire stopping because fibreglass is non-combustible and blocks flame

C. The top plates of the wall, the subfloor above, and the bottom plate of the upper wall create a horizontal platform that automatically blocks the vertical stud cavities — this is the fundamental fire-stopping advantage of platform framing over balloon framing

D. The drywall on the interior face of the wall provides fire stopping at every floor level in platform-frame buildings

57. A carpenter is installing a deck ledger board to an existing house. The ledger is bolted through the rim joist. The carpenter must install flashing above the ledger to prevent water from entering the wall behind it. What type of flashing is installed, and where does it go?

A. A continuous piece of metal flashing is installed over the top of the ledger, with its upper leg tucked behind the siding and integrated with the housewrap — water from the wall above flows over the flashing and drips off the front edge, clearing the ledger face

B. The ledger face is painted with waterproof sealant that provides the same protection as metal flashing above

C. A self-adhesive membrane is wrapped around the ledger board itself before it is bolted to the wall framing

D. A drip edge is installed beneath the ledger board to direct water away from the bottom of the connection

58. When framing a roof, the carpenter must install "collar ties" or "rafter ties" between opposing rafter pairs. The Building Code specifies a maximum height for collar ties measured from the top plate. If the collar ties are placed in the upper one-third of the rafter height, they resist the outward thrust at the wall plate. What happens if the ties are placed too high — in the upper one-quarter instead of the upper one-third?

A. Ties in the upper one-quarter are more effective because they are closer to the ridge where the thrust originates

B. Ties placed too high provide less benefit because the rafter is effectively free to spread for the lower portion

C. Ties in the upper one-quarter work identically to ties in the upper one-third because both prevent rafter spread

D. Ties in the upper one-quarter of the rafter span are less effective at resisting outward thrust — the shorter lever arm from the tie to the wall plate provides less mechanical advantage; the lower portion of the rafter below the tie can still push the wall outward under heavy loads

59. A carpenter is framing a floor opening for a skylight shaft that must be framed from the roof opening down to the ceiling opening below. The roof opening is 600 × 600 mm and the ceiling opening is 900 × 900 mm (the shaft flares from the smaller roof opening to the larger ceiling opening). How does the carpenter frame the flared shaft walls?

A. The shaft wall studs are cut at angles that follow the flare — each stud is angled outward from the roof opening to the ceiling opening; the top of each stud connects to the roof opening header and the bottom connects to the ceiling opening header at the wider dimension

B. The shaft walls are framed plumb (vertical) and the flare is created by adding angled drywall furring strips

C. The shaft is framed as two separate boxes (one at the roof, one at the ceiling) connected with flexible duct

D. The shaft walls are framed plumb and the flare is created entirely within the drywall compound application

60. A carpenter is framing a partition wall that will contain a recessed electrical panel (breaker box). The panel box is 400 mm wide × 550 mm tall × 100 mm deep. The wall is framed with 38 × 89 mm (2 × 4) studs at 400 mm on centre. The panel does not fit between standard stud spacing. How does the carpenter frame the wall at the panel location?

A. The panel is surface-mounted on the finished wall face because it cannot fit between the standard studs

B. The studs adjacent to the panel are shifted to create the required 400 mm clear width for the panel box

C. The panel must be recessed into the wall — the carpenter adjusts the stud spacing at the panel location to accommodate the 400 mm width, installs a header and sill to define the opening, and ensures the 100 mm depth fits within the 89 mm stud cavity (the panel may protrude slightly and require a flush-mount trim ring)

D. A deeper wall section (2 × 6 studs) is used only at the panel location to accommodate the 100 mm depth

61. A carpenter is installing pre-finished vinyl soffit panels in a wide eave overhang (900 mm from the wall to the fascia). Standard soffit panels are 300 mm wide. How does the carpenter span this 900 mm overhang?

A. Three 300 mm panels span the full width — two panels are joined end-to-end with an H-channel connector at mid-span, and the assembly runs from the wall J-channel to the fascia F-channel, with the H-channel providing intermediate support to prevent sagging

B. A single 300 mm panel is installed and the remaining 600 mm is left open for ventilation purposes only

C. Two 300 mm panels are installed from each side meeting at a butt joint in the centre without any support

D. A single 900 mm wide panel is custom-ordered from the manufacturer for the wide overhang application

62. When installing cedar shingle siding, the carpenter must use the correct nail type. Stainless steel or hot-dipped galvanized nails are specified. Why are standard electro-galvanized nails NOT acceptable for cedar shingle siding?

A. Electro-galvanized nails are too short for cedar shingles and do not provide adequate penetration depth

B. Electro-galvanized nails bend too easily when driven into the dense cedar wood near the butt end of shingle

C. Electro-galvanized nails have a thin zinc coating that corrodes quickly in the acidic environment created by cedar's natural tannins — the corroding nails produce black stains (iron oxide streaks) on the cedar surface and eventually lose holding power

D. Electro-galvanized nails have heads that are too large and create visible dimples on the cedar shingle surface

63. A carpenter is installing an exterior pre-hung door and must adjust the threshold to seal against the door bottom. The threshold has an adjustable vinyl seal that can be raised or lowered with screws. After setting the threshold, the carpenter closes the door and slides a dollar bill between the door bottom and the seal. The bill slides out easily at one end but holds at the other end. What does this test indicate?

A. The threshold seal material has deteriorated at the loose end and must be replaced with a new vinyl insert

B. The threshold is not level across its full width — one end is set lower than the other, creating an uneven seal; the adjusting screws at the loose end must be tightened to raise the seal until the dollar bill holds with consistent light resistance across the full threshold width

C. The door bottom sweep is worn unevenly and must be replaced before the threshold adjustment can hold

D. The subfloor beneath the threshold has a low spot that prevents the threshold from sitting flat at the loose end

64. A carpenter is installing metal roof panels and reaches a penetration where a plumbing vent pipe passes through the roof. The metal panel must be cut to fit around the pipe. What flashing system seals this penetration on a metal roof?

A. A standard rubber boot pipe collar (the same type used on asphalt shingle roofs) seals the pipe penetration

B. A bead of metal roofing sealant applied around the pipe base provides a watertight seal on the metal surface

C. The metal panel is cut tightly around the pipe and the gap is sealed with butyl tape for a flexible watertight joint

D. A manufactured metal roof pipe boot with a flexible EPDM rubber collar seals the pipe — the metal base plate is shaped to match the panel profile and is sealed with butyl tape sealant and screws to the metal panel surface

65. When installing vinyl siding on a gable end, the carpenter must cut the siding panels at an angle to follow the roof slope. Each panel is cut progressively shorter as the gable narrows toward the ridge. What technique ensures accurate angle cuts on each vinyl siding panel?

A. A sliding T-bevel is set to the roof slope angle and used to mark each panel at the cutting station — alternatively, a "pitch gauge" made from two small pieces of siding locked together at the gable angle provides a quick template for marking every panel

B. Each panel is held in position against the wall and marked individually by scribing against the roof surface

C. A mitre saw is set to a fixed angle matching the roof pitch and all panels are cut at this consistent angle

D. The panels are installed slightly long and trimmed in place with aviation snips after each course is nailed up

66. A carpenter is installing exterior cladding on a wall and reaches a location where an outdoor electrical receptacle is mounted in a weatherproof box. The box has a spring-loaded cover that closes over the receptacle when not in use. How must the carpenter detail the siding around this box?

A. The siding is cut to fit around the box perimeter and caulked to the box edges for a watertight seal at joint

B. The box is removed, the siding is installed continuously, and the box is reinstalled over the siding surface

C. A manufactured mounting block is installed over the housewrap at the box location before the siding — the siding terminates into the block's J-channel perimeter, and the electrical box mounts to the face of the block

D. The siding overlaps the box flanges by 12 mm on all sides and is sealed with flashing tape at the overlap

67. A carpenter finishes installing asphalt shingles and must apply roofing cement at specific critical locations. The cement provides additional adhesion and sealing beyond the shingle's self-seal adhesive strip. At which specific locations is roofing cement typically applied during a standard residential shingle installation?

A. Under every shingle tab on the entire roof for maximum wind resistance at each individual course location

B. At flashing termination points only — around pipe boots, step flashing ends, chimney cricket edges, and valley flashing terminals where the shingles transition to or from metal flashing components

C. Along the entire bottom edge of the starter course to bond it permanently to the drip edge below at the eave

D. At the ridge cap shingle locations only because the ridge receives the most direct wind exposure on the roof

68. A carpenter is installing a continuous gutter system and must determine the correct gutter size for the roof area it serves. The roof area draining to this gutter is 120 square metres. What factor determines the required gutter size?

A. Only the roof area determines the gutter size because all roofs have the same rainfall intensity in the region

B. Only the gutter slope determines the capacity because steeper gutters handle more water regardless of size

C. The gutter material (aluminum vs. steel) determines the required size because each material has a different flow

D. The gutter size is determined by the drainage area, the rainfall intensity for the region, and the gutter slope — a larger roof area or higher regional rainfall intensity requires a wider, deeper gutter to handle the peak water flow without overflowing

69. A carpenter is installing fibre cement lap siding and must leave a gap between the bottom of each siding course and any horizontal trim below it (such as a window sill). The minimum gap is typically 6 mm. What is the purpose of this gap?

A. The 6 mm gap allows water to drain behind the siding course rather than being trapped against the horizontal trim surface — if the siding contacts the trim, capillary action draws water upward into the joint, and the trapped moisture causes the fibre cement to swell and the trim to rot

B. The gap provides space for the expansion of the fibre cement siding in hot weather to prevent buckling

C. The gap allows air circulation behind the siding course for the rain screen ventilation system on the wall

D. The gap provides access for a caulking nozzle to seal the joint between the siding and the trim for finish

70. A carpenter is installing a pre-hung exterior door and must verify that the door sill pan (threshold flashing) is properly installed before the frame is set. The sill pan sits beneath the entire threshold and extends up the sides of the rough opening by at least 50 mm. What critical slope feature must the sill pan have?

A. The sill pan must slope inward so water drains to the interior floor drain during heavy rain penetration events

B. The sill pan must be level so the threshold sits flat and the door bottom seal makes uniform contact across it

C. The sill pan must slope outward so any water that reaches the pan surface drains toward the exterior — this is the last line of defense against water entry at the most vulnerable point of the door installation

D. The sill pan must slope toward one end so water collects at the low corner for drainage through a single weep

71. When installing horizontal vinyl siding, the carpenter reaches a location where two siding panels meet at a butt joint (the end of one panel overlaps the beginning of the next). What is the minimum overlap at a vinyl siding butt joint?

A. 12 mm (1/2 inch) overlap because the thin vinyl material provides adequate coverage at this minimum joint

B. 25 mm (1 inch) minimum overlap — this provides sufficient coverage to prevent wind-driven rain from penetrating the joint while accommodating the thermal expansion and contraction that occurs at each panel end

C. 50 mm (2 inches) overlap for maximum weather protection at every butt joint across the wall surface area

D. No overlap is needed because the J-channel behind the joint captures any water that penetrates the butt joint

72. A carpenter is installing a skylight on a shingle roof and must flash the junction between the skylight curb and the roof surface. The flashing follows the standard bottom-to-top sequence. After installing the sill flashing and step flashing along both sides, the carpenter installs the head (top) flashing. The head flashing must extend beneath what component above it?

A. The head flashing lower edge sits on top of the last shingle course above the skylight for an exposed detail

B. The head flashing sits on top of the step flashing at each side for a surface-mounted connection at the top

C. The head flashing is tucked beneath the metal drip edge at the ridge for integration with the ridge flashing

D. The head flashing is tucked beneath the shingle courses above the skylight — the shingles above lap over the flashing so water flowing down the roof passes over the flashing and continues downward without entering behind it

73. A carpenter is installing exterior stone veneer (adhered type) on a wood-frame wall. Before applying the mortar scratch coat, the carpenter installs metal lath over the weather-resistive barrier. The lath is installed with the cups (dimples) facing outward (away from the wall). Why must the cups face outward?

A. When the cups face outward, the mortar scratch coat squeezed through the lath fills the cup spaces and locks behind the mesh when it hardens — if the cups face inward (toward the wall), the mortar cannot key through the lath and the scratch coat has no mechanical bond

B. Outward-facing cups allow water to drain down the lath surface behind the scratch coat to the base of wall

C. Outward-facing cups provide additional insulation value by trapping air pockets between the lath and wall

D. The cup orientation has no structural effect and is only a manufacturer preference for aesthetic appearance

74. A carpenter is installing pre-finished aluminum fascia cover and must join two pieces at a vertical joint. The aluminum pieces overlap by 50 mm. The carpenter applies a thin bead of exterior sealant between the overlapping surfaces. What additional step prevents the joint from gapping open over time?

A. The overlap is secured with blind rivets or screws that mechanically lock the two pieces together at the joint

B. The sealant alone provides adequate long-term bond because aluminum sealants are specifically formulated

C. A pop rivet (blind rivet) or small screw is installed through both layers at the overlap to provide a mechanical connection that holds the joint tight — the sealant provides weatherproofing while the fastener prevents the joint from separating as the aluminum expands and contracts

D. The joint is left unfastened because the receiving channels at the top and bottom hold both pieces in position

75. When installing cedar bevel siding, the carpenter must back-prime all boards before installation. "Back-priming" means applying primer to the back face (the side against the wall) of every siding board. Why is back-priming necessary?

A. Back-priming prevents insects from boring into the unpainted back surface of the cedar siding material

B. Back-priming seals the back surface against moisture absorption — without it, the back face absorbs moisture from the wall while the painted front face resists moisture; this differential moisture content causes the board to cup (curl) and pull away from the wall, cracking paint and opening joints

C. Back-priming provides fire resistance to the concealed surface that would otherwise be exposed to flame

D. Back-priming is only required by some manufacturers and has no functional benefit for siding performance

76. A carpenter is completing the exterior cladding installation and must verify that all wall penetrations (pipes, vents, wires, hose bibs) are properly flashed and sealed. During the inspection, the carpenter discovers that a gas pipe penetration has no flashing — the siding was cut around the pipe and left unsealed. What is the consequence of this omission?

A. The unsealed gas pipe penetration only affects the aesthetic appearance of the cladding at that location

B. The gas pipe material prevents water penetration because the metal surface sheds water away from the hole

C. The gas pipe penetration is self-sealing because the pipe fits tightly against the siding edge around the cut

D. Water enters the wall cavity through the unsealed gap around the pipe during every rain event — the moisture accumulates behind the cladding, saturating the sheathing and framing, causing concealed rot, mould, and eventual structural damage that may not be discovered for years

77. A carpenter is installing a pre-hung interior door in a hallway. The hallway wall is offset — the wall on the hinge side is 12 mm further from the centre line than the wall on the strike side. This means the rough opening is not centred in the wall. If the carpenter centres the door frame in the rough opening, the casing reveal will be different on each side. How does the carpenter handle this condition?

A. The carpenter installs the jamb plumb and centred in the rough opening, then uses different-width casing on each side — wider casing on the side where the wall is further back and narrower casing on the side where the wall is closer

B. The carpenter shifts the jamb toward the closer wall side so the casing reveal is equal on both sides — the wider gap on the offset side is shimmed and insulated

C. The carpenter installs the door frame flush with one wall face only and uses a flat trim on the opposite side

D. The door frame must be reordered in a wider size that accommodates the 12 mm offset between the walls

78. When installing a floating laminate floor, the carpenter must install the underlayment correctly. The underlayment sheets are laid on the subfloor with edges butted together (not overlapped). Why must the edges not overlap?

A. Overlapping underlayment creates a moisture barrier that prevents the subfloor from breathing properly

B. Overlapping underlayment doubles the thickness at the overlap seam, creating a ridge beneath the thin laminate

C. Overlapped underlayment edges create a double-thickness ridge that telegraphs through the thin laminate planks as a visible bump — the planks rock on this ridge, causing clicking noises and eventually damaging the locking mechanism at the joints

D. Overlapping underlayment wastes material because the additional coverage provides no thermal benefit

79. A carpenter is installing a bathroom vanity and must secure it to the wall. The vanity has a reinforced mounting rail across the back panel at the top. The carpenter drives screws through this rail into the wall studs. How many screws are needed and what penetration is required?

A. One screw at the centre of the vanity into the nearest stud provides adequate support for the light cabinet

B. At least one screw at every stud location across the vanity width, with each screw penetrating at least 32 mm into the stud — the combined screws must resist the tendency of the loaded vanity to tip forward away from the wall

C. Two screws at the ends of the mounting rail only, driven into the wall studs at each corner of the vanity

D. Adhesive applied to the mounting rail replaces screws and provides a cleaner installation without visible heads

80. A carpenter is installing a stairway and must verify the guard (guardrail) balusters. The Building Code requires that a 100 mm sphere cannot pass through any opening. The carpenter tests the installed balusters and discovers that at one location, the sphere just passes through. The clear gap at this location measures 102 mm. How should the carpenter correct this?

A. The 2 mm excess is within construction tolerance and does not require correction for the building inspection

B. The carpenter adds a thin spacer strip between the two wide-spaced balusters to reduce the gap below 100 mm

C. The baluster spacing only needs to meet code at the top rail connection and floor-level spacing is exempt

D. The carpenter must add an additional baluster or reposition the adjacent balusters to reduce the clear gap to 100 mm or less — the 100 mm sphere test is an absolute maximum with no tolerance allowed

81. A carpenter is installing crown moulding in a room with 2.74 m (9-foot) ceilings. The moulding has a projection (the distance it extends from the wall) of 75 mm and a drop (the distance it extends below the ceiling) of 100 mm. Before installing the moulding, the carpenter must locate and mark the wall studs. Why is stud location critical for crown moulding installation?

A. Crown moulding is decorative only and does not require nailing into studs for adequate support in place

B. The lower nails must penetrate wall studs for secure attachment — crown moulding nailed only into drywall pulls away from the wall over time because the drywall cannot support the moulding weight and the leverage created by the angled position between the wall and ceiling

C. The stud locations determine where the mitre joints must fall for structural support at each joint location

D. The studs provide a reference line for marking the crown moulding height consistently around the room

82. A carpenter is installing a medicine cabinet in a bathroom. The cabinet is surface-mounted (not recessed). The cabinet weighs 12 kg empty and will hold an additional 8 kg of contents. The mounting hardware consists of a keyhole bracket on the cabinet back and two screws in the wall. Where must these screws be driven?

A. Into the drywall only using toggle bolts because the 20 kg total weight is within drywall anchor capacity

B. Into wall studs using wood screws that provide adequate pull-out resistance for the 20 kg total weight

C. Into the wall using adhesive anchors that bond chemically to the drywall core for a permanent hold

D. Into the wall studs, or if studs are not available at the mounting location, into appropriate drywall anchors rated for at least 20 kg of pull-out load — the screws must resist both the static weight and any dynamic force from the door being opened or contents being accessed

83. When installing hardwood flooring near an exterior wall, the carpenter must leave an expansion gap between the flooring and the wall. During humid summer months, the flooring expands toward the wall. During dry winter months, the flooring contracts away from the wall. What is the typical expansion gap size for hardwood strip flooring?

A. 10 to 12 mm (approximately 3/8 to 1/2 inch) — this gap provides adequate space for the maximum seasonal expansion of the hardwood across the room width without the flooring pressing against the wall and buckling

B. 3 mm (1/8 inch) because hardwood flooring expands very little across its width in modern climate control

C. 25 mm (1 inch) to provide maximum expansion space for the widest possible seasonal moisture variation

D. No gap is needed because modern hardwood flooring is kiln-dried and dimensionally stable at all humidities

84. A carpenter is installing drywall on a wall that will receive ceramic tile (kitchen backsplash area — a dry application). The drywall must be installed with the smooth paper face outward. Before tiling, what surface preparation does the drywall require?

A. No preparation — the tile is adhered directly to the paper face of the drywall with thinset mortar at the kitchen

B. The drywall paper must be scored with a utility knife in a crosshatch pattern to create a mechanical key

C. The drywall must be primed with a thinset-compatible primer that improves the bond between the thinset mortar and the smooth paper face — without primer, the thinset may not develop adequate adhesion to the paper surface

D. The drywall must be sealed with polyurethane to prevent moisture from the thinset from softening the paper

85. A carpenter is installing a stairway and the architect specifies an open stringer (cut stringer) with a "return nosing" on the open side. A return nosing is a small piece of tread material that wraps around the front and side of the exposed tread end. What function does the return nosing serve?

A. The return nosing increases the structural capacity of the tread by adding material at the exposed end

B. The return nosing creates a finished end on the exposed tread that conceals the end grain and provides a consistent nosing profile around the visible edge — without it, the raw tread end grain is exposed and the nosing profile terminates abruptly at the stringer face

C. The return nosing provides additional slip resistance at the open side of the tread where falls are most likely

D. The return nosing is required by the Building Code for all open stringer stairways for the safety of occupants

86. A carpenter is installing a bathroom exhaust fan and must size the fan for the room. The Building Code requires a minimum ventilation rate based on the bathroom size. For a standard bathroom (approximately 5 m^2 / 50 square feet), what is the typical minimum fan rating?

A. 25 CFM because small bathrooms require only minimal ventilation to control moisture in the enclosed space

B. 40 CFM because the fan rating should approximately match the room area in square feet for adequate moisture

C. 100 CFM because all bathroom fans must exceed the maximum possible moisture generation rate at all times

D. Approximately 50 CFM — the standard recommendation is 1 CFM per square foot of bathroom floor area, or a minimum of 50 CFM for bathrooms up to 50 square feet; larger bathrooms require proportionally higher CFM ratings

87. When installing baseboard, the carpenter reaches an inside corner. The first piece is cut square and butted into the corner. The second piece must be "coped" to fit over the profile of the first piece. The carpenter first cuts a 45-degree inside mitre on the second piece, then follows the profile line with a coping saw. After cutting, the carpenter test-fits the coped joint. The joint has a gap at the bottom. What is the most likely cause?

A. The coping saw cut did not follow the profile line closely enough at the bottom curve — the carpenter must re-cut the coped profile, removing more material at the bottom where the gap exists; the coping saw blade should be angled to undercut the back of the profile (removing more material behind than at the face) so the visible edge fits tightly against the butted piece

B. The wall corner is not square and the butted piece does not reach fully into the corner at the floor level

C. The baseboard material has shrunk since the first piece was installed and the coped piece no longer matches

D. The floor at the corner is higher than the floor at the wall centre, lifting the baseboard away from the profile

88. A carpenter is installing a pre-hung interior door and notices that the door slab has a visible warp — the top right corner is twisted approximately 4 mm out of plane with the other three corners. When the door is closed, the top right corner contacts the stop before the other corners, leaving a gap at the bottom right. Can this door be adjusted to close properly?

A. Yes, by adding a thin cardboard shim behind the top hinge to push the top of the door away from the stop

B. Yes, by planning the strike edge of the door to remove 4 mm and allow the latch to engage at the strike plate

C. A 4 mm warp can sometimes be corrected by adjusting the hinge mortise depths — deepening the top hinge mortise and shimming the bottom hinge mortise can twist the door within the frame to compensate for the warp; if the warp exceeds correction limits, the door slab must be replaced

D. No, a warped door slab cannot be adjusted and must be returned to the manufacturer for a replacement

89. A carpenter is installing tile backer board on the walls of a shower enclosure. The backer board panels are butted together at the joints. The joints must be treated before tile installation. What material is used to treat the backer board joints?

A. Standard paper drywall tape embedded in drywall joint compound is applied to every backer board joint

B. Alkali-resistant fibreglass mesh tape embedded in modified thinset mortar is applied at every joint — this treatment reinforces the joint against cracking from building movement and provides a continuous surface for tile installation

C. Self-adhesive waterproof membrane tape is applied directly over each joint without any embedding material

D. No joint treatment is needed because the tile and grout applied over the joints provide adequate coverage

90. A carpenter has completed installing all interior doors, trim, and cabinets. The final painting is complete. Two months later, the homeowner reports that the crown moulding has developed gaps at several joints and the baseboard has pulled away from the wall at two inside corners. The home's humidity has been maintained at 35% RH since the HVAC was commissioned. What is the most likely cause?

A. The paint crew applied too many coats that added weight to the moulding and pulled the joints apart over time

B. The framing lumber behind the drywall has shrunk from drying, pulling the wall surfaces inward at the studs

C. The house has settled unevenly on the foundation, distorting the wall surfaces and opening trim joints

D. The wood trim was installed at a higher moisture content than the current 35% RH environment — as the trim acclimates to the drier conditions, it shrinks across its width, opening joints at the crowns and pulling the baseboard away from the wall at inside corners where the butt joint has separated

91. A carpenter is renovating a house built in 1965 and must remove the existing flooring to install new hardwood. After pulling up the carpet, the carpenter discovers 9 × 9 inch vinyl tiles beneath. Why should the carpenter stop before removing these tiles?

A. Vinyl tiles manufactured before the mid-1980s — particularly the 9 × 9 inch format — commonly contain asbestos in both the tile and the black adhesive (mastic) beneath; the material must be sampled and tested before any disturbance because breaking, grinding, or scraping releases asbestos fibres

B. The 9 × 9 inch tiles are a historically significant floor covering that must be preserved under heritage rules

C. The adhesive beneath the tiles is petroleum-based and releases explosive vapours when the tiles are broken

D. The tiles contain lead pigments that become airborne when disturbed during the removal scraping process

92. During a renovation, a carpenter discovers that the existing bathroom subfloor has water damage around the toilet location. The plywood is delaminated and soft within a 600 mm radius of the toilet flange. The carpenter removes the damaged section. Before installing the new subfloor patch, what must be verified?

A. That the replacement plywood matches the colour of the existing subfloor for a consistent appearance

B. That the existing floor joists beneath the damaged area are sound — prolonged moisture exposure may have caused the joists to rot at the same location; the carpenter must probe the joists for softness and check for mould

C. That the exact same brand of plywood is available for a manufacturer-matched repair at the subfloor patch

D. That the tile adhesive residue is completely removed from the joist tops before the new plywood is installed

93. A carpenter is performing an energy retrofit and must seal air leakage at the top of the foundation wall where the sill plate meets the concrete. This junction is one of the largest air leakage sources in older homes. What material is best for sealing this joint?

A. Fibreglass batt insulation stuffed between the sill plate and the concrete for thermal and air sealing purposes

B. A sill gasket foam (installed during new construction) or spray foam applied along the sill-to-concrete junction — the foam expands to fill irregular gaps between the rough concrete surface and the wood sill, providing both air sealing and insulation

C. A bead of exterior caulking applied along the visible edge of the sill plate at the basement wall interior face

D. A strip of polyethylene vapour barrier stapled over the sill plate area from the subfloor to the concrete wall

94. A carpenter is renovating a kitchen and the homeowner wants to remove a wall between the kitchen and the dining room. The carpenter suspects the wall is load-bearing because it runs perpendicular to the floor joists above. Before demolition, how does the carpenter confirm whether the wall is load-bearing?

A. The carpenter checks whether the wall has a double top plate, which indicates it was built as a bearing wall

B. The carpenter checks the wall for electrical wiring because load-bearing walls typically have more circuits

C. The carpenter consults the original building plans to verify the structural intent of the wall in the design

D. The carpenter examines multiple indicators: the wall runs perpendicular to the joists above; it has a beam or bearing point below it in the basement; it has a double top plate; the joists above lap or splice at the wall line; ultimately, a structural engineer should confirm the wall's load-bearing status before any removal

95. A carpenter is converting an attached garage into a living space. The existing garage floor is a concrete slab that is 100 mm lower than the adjacent house floor. The carpenter must raise the garage floor to match the house floor level. What method raises the floor level while providing insulation?

A. A sleeper system with pressure-treated 2 × 4 sleepers laid flat on the concrete, with rigid foam insulation between them and a plywood subfloor on top — the combined height of the sleepers and plywood raises the floor approximately 64 mm (38 mm sleeper + 19 mm plywood + underlayment); if more height is needed, taller sleepers or additional layers are used

B. Pour a 100 mm layer of lightweight concrete over the existing slab to raise it to the house floor elevation

C. Stack two layers of plywood directly on the bare concrete to raise the level without any insulation or barrier

D. Install carpet padding in multiple layers to build up the floor height to match the house floor level quickly

96. A carpenter is renovating a bathroom and discovers that the existing bathtub waste pipe connects directly to the main building drain without a P-trap. This means sewer gases can rise directly from the drain system into the bathroom. What must be installed to correct this condition?

A. A mechanical vent (air admittance valve) at the waste pipe to prevent sewer gas from entering the room

B. A charcoal filter on the waste pipe that absorbs sewer gases before they enter the bathroom through drain

C. A P-trap must be installed in the bathtub waste pipe — the P-trap holds a water seal that blocks sewer gases from rising through the drain into the living space; every plumbing fixture in a building must have a trap

D. An exhaust fan running continuously in the bathroom provides adequate dilution of any sewer gas present

97. A carpenter is renovating a commercial building and must install a fire-rated door in a 1-hour fire-rated wall. The door is a 45-minute fire-rated hollow metal door with a self-closing mechanism. The carpenter installs the door, but the building inspector notes that the carpenter used a standard residential lockset. Why is this a problem?

A. The residential lockset is not strong enough for commercial traffic and will wear out prematurely from use

B. The residential lockset may not be fire-rated — fire-rated doors require fire-rated hardware (locksets, hinges, and closers) that have been tested as part of the fire-rated assembly; non-rated hardware can fail in a fire, allowing the door to open and fire to spread through the opening

C. The residential lockset does not match the commercial aesthetic standards for the building's door hardware

D. The residential lockset interferes with the self-closing mechanism because commercial closers require specific latch types to engage properly during the automatic closing cycle

98. A carpenter discovers during a renovation that the existing house has aluminum wiring. The electrician recommends replacing all the aluminum wiring with copper. However, the homeowner

cannot afford a complete rewire. What alternative does the electrician offer as a safer, less expensive option?

A. Wrapping each aluminum wire connection with electrical tape for additional insulation at the junction points

B. Installing arc-fault circuit interrupter (AFCI) breakers on all aluminum circuits as the sole remediation step

C. Coating all aluminum wire connections with anti-oxidant compound to prevent the oxidation buildup issue

D. Installing approved aluminum-to-copper connectors (such as COPALUM or AlumiConn connectors) at every switch, outlet, and junction box — these connectors create a safe transition between the aluminum wire and the copper device terminals, addressing the high-resistance connection problem

99. A carpenter completes a major renovation and must ensure that the homeowner receives all necessary documentation. One critical document is the "as-built" drawing. What does an as-built drawing document?

A. The as-built drawing records the actual constructed conditions as they exist after the renovation is complete — including any changes from the original approved plans, the precise locations of concealed structural members, the routing of plumbing and electrical within walls and floors, and any field modifications made during construction

B. The as-built drawing is the original architectural plan that was submitted with the building permit application

C. The as-built drawing is the engineer's structural calculations that support the beam and post design loads

D. The as-built drawing is the building inspector's report documenting all inspections performed during work

100. A carpenter finishes a renovation and the homeowner asks about the expected maintenance schedule for the new work. The carpenter advises the homeowner to perform annual exterior inspections. What specific items should the homeowner check during this annual inspection?

A. Only the interior paint condition needs annual inspection because exterior components are maintenance-free

B. Only the roof shingles need annual inspection because they are the most exposed component to weather

C. All caulking joints at windows, doors, and penetrations for cracking or separation; all weatherstripping for compression loss; roof flashing for lifted edges or sealant failure; gutters and downspouts for blockages and joint leaks; exterior paint or stain for peeling or fading; foundation grade for settlement toward the building; and deck fasteners for looseness or corrosion

D. Only the HVAC system filter needs replacement because all other renovation components require no annual check

Practice Exam 21: Answer Key and Explanations

1. B — A toed-in fence narrows the gap between the fence and the back of the blade. As the workpiece passes the blade's front teeth and advances toward the rear, the converging fence pinches the wood against the rising rear teeth. These rear teeth grab the trapped wood and throw it back at the operator in a violent kickback.

2. D — A child on a construction site faces immediate life-threatening hazards — open excavations, exposed nails, power tools, and moving equipment. The carpenter must stop work, safely guide the child away from all dangers, place them with a responsible adult, and report the incident. The site perimeter must be secured to prevent re-entry.

3. A — Even Class 2 and Class 3R construction lasers can cause eye damage with prolonged direct exposure to the beam. Workers must never stare directly into the laser source. Warning signs should be posted in the laser work area, and the beam path should be kept at a height that minimizes the chance of eye-level exposure.

4. C — The canopy must withstand the impact of tools, materials, and debris falling from the scaffold platform above. A dropped tool accelerating over several storeys generates significant impact force. The canopy design must resist this dynamic load without collapsing onto pedestrians walking beneath it.

5. B — Dry cutting granite produces airborne crystalline silica dust that causes silicosis — a progressive, irreversible lung disease. Water suppression eliminates over 90% of the dust and cools the

diamond blade, which overheats rapidly without water cooling. Dry cutting without respiratory protection creates dual hazards of silica exposure and blade failure.

6. D — A broken ratchet pawl spring or damaged locking mechanism prevents the strap from holding tension. During transport, the unsecured load shifts under braking, acceleration, and cornering forces. The strap must be replaced immediately with a functioning ratchet — a failed load securement device is the same as no device at all.

7. A — When provincial OHS regulations and a project-specific safety plan appear to conflict, the more stringent requirement always applies. This principle ensures the highest level of worker protection regardless of which document specifies the requirement. The site safety officer should be consulted to clarify any apparent conflicts.

8. C — A single 38 × 89 mm board spanning 2.4 metres between posts cannot resist the required 900 N (approximately 90 kg) point load at mid-span without excessive deflection. The guardrail must be upgraded with a stronger member — a doubled board, deeper lumber, or posts spaced closer together to reduce the span.

9. B — OHS regulations require a valid certified first aid attendant on construction sites with multiple workers. An expired certificate means the attendant's competency has not been verified within the required timeframe. Work cannot continue until a person with a current, valid first aid certificate is present on site.

10. D — Flammable aerosol propellant disperses at low level and can travel across the room to an ignition source such as the furnace pilot light. If the vapour concentration reaches the lower explosive limit (typically 1 to 3% for common propellants) at the flame, an explosion or flash fire occurs. The furnace must be shut off during spray adhesive application.

11. A — Both carpenters position on the same side, lift together on a coordinated verbal count, walk the wall up using a hand-over-hand technique, and brace it immediately. Clear communication prevents one person from lifting before the other, and a pre-planned bracing sequence prevents the wall from falling in either direction.

12. C — A warm extension cord indicates the wire is carrying current near its rated capacity. The electrical resistance converts this current to heat. Continued loading risks melting the insulation (fire

hazard), causing a voltage drop that damages tools, or creating a short circuit. The carpenter must reduce the load on the warm cord.

13. D — A dashed diagonal line from where a lower roof meets the main roof represents a valley line — the intersection creates a V-shaped channel that collects and directs rainwater downward from both adjoining roof surfaces. The valley must be flashed to prevent water penetration at this concentrated flow path.

14. A — Three stringers are needed: one at each side and one at the centre. The two spans of 550 mm each (1,100 ÷ 2) are well within the 750 mm maximum for 38 mm treads. Two stringers alone would create a single 1,100 mm span that exceeds the maximum, causing the treads to deflect under foot traffic.

15. C — Room perimeter = 2(4.2 + 3.6) = 15.6 metres. Subtract the doorway width: 15.6 − 0.9 = 14.7 metres of net baseboard. The doorway does not require baseboard because the door casing covers the opening. This net measurement is the starting point before adding waste allowance.

16. B — The double-centering test (transiting the telescope) checks horizontal collimation. The carpenter sights a target, locks the horizontal clamp, transits the telescope 180 degrees, and re-sights the same target. If the crosshair does not return to the exact same point, the instrument has a horizontal collimation error.

17. D — "W200 × 46" is the standard steel designation: a W-shape (wide flange I-beam) approximately 200 mm deep and weighing 46 kg per metre of length. The carpenter uses this information to determine beam clearances in the framing, size beam pockets, and verify the steel delivery matches the structural drawings.

18. A — Rear elevation = front elevation − excavation depth = 100.000 − 1.500 = 98.500 m. This is a straightforward subtraction because the rear must be lower than the front by the specified excavation depth. The carpenter uses this target elevation for layout and grade verification with the builder's level.

19. C — "CJ" stands for "Control Joint" — a predetermined groove or saw cut that creates a weakened plane in the slab. Shrinkage cracking is inevitable in concrete, but the control joint directs the crack to a straight, planned line rather than allowing random, uncontrolled cracking across the floor surface.

20. B — Board feet per piece = (thickness × width × length) ÷ 12 = (2 × 10 × 16) ÷ 12 = 26.67 bf. Total = 50 × 26.67 = 1,333 board feet. The formula uses nominal dimensions (not actual) and divides by 12 because one board foot equals a 1-inch-thick, 12-inch-wide, 12-inch-long piece.

21. B — The maximum hole diameter in a 2 × 6 stud is approximately 56 mm (40% of 140 mm). A 75 mm vent stack exceeds this maximum. The carpenter must route the vent through the clear space between studs, installing blocking above and below the vent to maintain the stud module for sheathing and drywall nailing.

22. A — At long sighting distances, Earth's curvature and atmospheric refraction affect the line of sight. At 45 metres, the combined effect is approximately 0.1 to 0.2 mm — negligible for parking lot grading. Beyond 100 metres, these effects become significant and must be accounted for in precise levelling work.

23. D — Total plan area = (8.0 × 12.0) + (3.0 × 4.0) = 96.0 + 12.0 = 108.0 m². Apply slope factor: 108.0 × 1.118 = 120.7 m² ≈ 121 m². The slope factor converts the horizontal plan area to the actual sloped surface area where the insulation is installed.

24. B — "FX/AW" indicates a window with two sections: "FX" is a Fixed (non-operable) section, and "AW" is an Awning section that is hinged at the top and swings outward from the bottom. This combination provides light through the fixed panel and ventilation through the operable awning panel.

25. C — Slope angle = arctan(4/12) = arctan(0.333) ≈ 18.4 degrees. This conversion from pitch ratio to degrees is used when setting bevel gauges, mitre saws, and digital angle finders for rafter cuts and other angle-dependent layout operations.

26. A — Each side of the beam needs (14,000 ÷ 400) + 1 = 36 joists. Two sides = 36 × 2 = 72 joist pieces total. Each joist spans 5.0 metres from the perimeter wall to the centre beam, and the joists on each side are separate pieces that bear on the flush beam using joist hangers.

27. D — Before the concrete fully hardens, the carpenter rakes or scarifies the top surface to approximately 6 mm depth using a rake, broom, or roughening tool. This rough profile provides mechanical bond for the subsequent pour. A smooth surface creates a weak cold joint because the second pour has no texture to grip.

28. B — Each 1% of entrained air reduces compressive strength by approximately 5%. Interior structural columns require maximum compressive capacity and are not exposed to freeze-thaw cycles. The strength reduction from air entrainment is an unnecessary penalty for columns that don't need freeze-thaw protection.

29. C — The form panels at corners must be clamped tightly with edges butted flush to prevent grout leakage. A chamfer strip or foam backer rod placed in the inside corner seals the joint and creates a clean bevelled edge. Without this seal, cement paste leaks through the gap, leaving voids and fins on the concrete.

30. A — Concrete that is too high must be removed by pulling it away — not pushed down. Compressing the surface creates a dense layer over a loosely consolidated subsurface that can delaminate. The screed bar strikes off the excess to the correct elevation defined by the grade references.

31. D — Snap ties are designed with a weakened "break back" point below the concrete surface. After stripping, the tie ends break off at this predetermined point, leaving a small recess. The recess is patched with non-shrink grout or polymer-modified patch to seal the hole and protect the embedded steel from corrosion.

32. B — A laser screed is a machine-operated system with a laser-guided boom that spreads, levels, and compacts concrete to a laser reference plane. The machine produces flatter, more consistent slabs over large areas than hand screeding, meeting tight F-number tolerances required for commercial and industrial floors.

33. D — Easy vibrator penetration in the current lift could indicate the previous lift has begun to stiffen (less resistance from a different consistency below) or the current lift has excess water. Either condition requires investigation — a stiffened lower lift creates a cold joint, and excess water weakens the concrete.

34. A — Type HE stands for "High Early" strength. This cement develops strength more rapidly than standard Type GU, allowing faster form stripping, earlier loading, and shorter construction schedules. The accelerated early strength gain is achieved through finer grinding of the cement clinker particles.

35. D — FF (Floor Flatness) measures local bumpiness over short distances (how flat the surface is between any two nearby points). FL (Floor Levelness) measures overall slope or tilt over longer

distances. Higher F-numbers indicate flatter and more level floors. FF 35/FL 25 is a moderate commercial standard.

36. B — The haunch form flares outward at each end, following the haunch profile from the wider bearing section to the standard beam width. The side panels are cut to the haunch shape (wider at the bottom, narrowing over the transition length), and the soffit panel widens correspondingly to form the complete haunch profile.

37. A — When concrete arrives above the maximum specified temperature, the batch plant can add ice as part of the batch water, use chilled water, or inject liquid nitrogen to reduce the mix temperature. Adding plain water changes the water-cement ratio and reduces strength. The concrete must be below 30°C before placement.

38. C — All form ties share one common function: they resist lateral concrete pressure by acting in tension across the wall thickness. The tie rod transfers the outward pressure from one form panel through the concrete to the opposite panel, preventing the forms from spreading apart under the hydrostatic load.

39. B — The trowel blade starts at a moderate angle (10 to 15 degrees) for the first pass and is progressively flattened with each successive pass. Flatter blade angles apply more pressure and friction to the surface, producing a denser, harder, smoother finish with each pass as the concrete stiffens.

40. D — Coloured concrete is extremely sensitive to any inconsistency in forming, placement, or finishing procedures. Different form materials, release agents, pour rates, or vibration techniques produce visible colour variations. Every aspect of the process must be consistent throughout the entire pour for uniform colour.

41. D — The earth face is exposed to sustained soil moisture, aggressive soil chemistry, and potential abrasion from backfilling equipment and settlement. Thicker concrete cover provides greater protection for the embedded reinforcing steel against corrosion that is accelerated by these harsh exposure conditions.

42. B — Zero-bleed conditions can result from dry granular base absorbing water from the concrete bottom or from higher-than-specified air content. The surface dries and stiffens rapidly without the normal bleed water replenishment, shrinking the finishing window dramatically and increasing the risk of plastic shrinkage cracking.

43. C — SDS (Simpson Strong-Drive) screws are structural wood screws engineered for higher shear capacity per fastener than standard joist hanger nails. Fewer SDS screws achieve the same connection capacity as the full complement of nails, and they install faster with a standard impact driver or drill.

44. A — The common difference for hip jack rafters equals the rafter spacing (converted to the same units as the unit line length) multiplied by the common rafter unit line length, divided by 12 to convert from inches to feet. This constant value is subtracted from each successive jack rafter to determine its length.

45. D — A pocket door in a load-bearing wall requires engineering because the split studs in the pocket frame cannot carry the full bearing loads. The engineer designs a header system that transfers all loads above the pocket to full-height studs on each side, bypassing the reduced-capacity pocket frame entirely.

46. B — A crowned joist creates a high spot that telegraphs through the subfloor as a visible ridge in any finished flooring. The carpenter must plane the crown down to match the adjacent joist tops before applying the subfloor. Leaving the crown produces a permanent bump that no finished flooring can conceal.

47. C — A flat 2 × 4 can span 2.4 metres in a non-bearing wall because it only supports the weight of the wall framing above (double top plate, cripple studs, and sheathing). However, the carpenter should verify with the Building Code tables that this member is adequate for the specific loading at this location.

48. A — The factory-installed web hole reinforcer is pre-positioned at a location where the manufacturer has pre-approved a large hole for HVAC ductwork or plumbing. The reinforcer maintains the joist's shear capacity at the weakened hole location, eliminating the need for field-installed reinforcement.

49. A — Simple beam-on-post bearing relies only on gravity. Lateral forces from wind, seismic events, or horizontal deck loads can knock the beam off the post. The manufactured connector mechanically ties the beam to the post, preventing lateral displacement and wind uplift separation.

50. B — The first gable stud at 400 mm from the corner rises above the top plate by the stud spacing multiplied by the pitch ratio: 400 × (6/12) = 400 × 0.5 = 200 mm. Each successive stud is 200 mm taller than the previous one (the common difference for gable studs).

51. C — Piggyback trusses are used when the full-height truss exceeds approximately 4.15 metres — the maximum legal transport height for standard truck trailers. Splitting the truss into two stackable sections (base and cap) allows both sections to be delivered on standard-height trailers and assembled on site.

52. A — The partition-to-exterior wall intersection creates a horizontal channel along the top plate where fire can travel from one stud bay to the next. Without fire blocking at this junction, fire entering any bay can spread horizontally through the channel and into the attic, bypassing the wall cavity containment.

53. D — When the cantilever is loaded, the backspan acts as a lever arm and the far end lifts. Blocking and structural connections between the cantilevered joists and the floor framing above at the backspan end mechanically resist this uplift force, preventing the overturning that would cause the cantilever to drop.

54. B — Advanced framing reduces the amount of wood in the wall, increasing the insulation cavity volume and decreasing thermal bridging through wood studs. Each stud is a thermal bridge that conducts heat through the wall. Fewer studs and simplified framing details improve the wall's overall thermal performance.

55. A — With a structural ridge beam, the rafters act as simply supported beams — they push only downward at the wall plate, not outward. The beam carries the vertical roof loads directly through posts to the foundation. Ceiling joists or collar ties are not needed because there is no outward thrust to resist.

56. C — In platform framing, the top plates, subfloor, and bottom plate of the upper wall create a continuous horizontal platform that blocks the vertical stud cavities at every floor level. This is the fundamental fire-stopping advantage of platform framing — balloon framing lacks these horizontal barriers.

57. A — A continuous piece of metal flashing above the ledger has its upper leg tucked behind the siding and integrated with the housewrap. Water from the wall above flows over the flashing and drips off the front edge, clearing the ledger face. Without this flashing, wall water enters behind the ledger and rots the rim joist.

58. D — Collar ties in the upper one-quarter provide less mechanical advantage because the shorter lever arm from the tie to the wall plate is less effective at resisting the outward thrust. The lower portion

of the rafter below the tie can still push the wall outward under heavy loading because the tie cannot restrain it effectively.

59. A — The shaft wall studs are cut at angles matching the flare from the smaller roof opening to the larger ceiling opening. Each stud is angled outward, with the top connected to the roof opening header frame and the bottom connected to the ceiling opening header at the wider dimension.

60. C — The carpenter adjusts the stud spacing at the panel location, installs a header above and a sill below to define the recessed opening, and verifies that the 100 mm panel depth fits within the 89 mm stud cavity. A slight protrusion may require a flush-mount trim ring to finish the installation cleanly.

61. A — The 900 mm overhang requires intermediate support. Three 300 mm panels are connected with H-channel connectors at mid-span locations (approximately 300 mm and 600 mm from the wall). The H-channels provide structural support that prevents the narrow panels from sagging across the wide span.

62. C — Electro-galvanized nails have a thin zinc coating that corrodes rapidly in the acidic environment created by cedar's natural tannins. The corroding iron produces black rust streaks on the cedar surface and eventually loses holding power. Stainless steel or hot-dipped galvanized nails resist this acidic corrosion.

63. B — The dollar bill test reveals that the threshold seal is tighter at one end than the other. The adjusting screws at the loose end must be tightened to raise the seal until the dollar bill holds with consistent light resistance across the full width. An uneven seal allows air and water infiltration at the loose section.

64. D — Metal roof pipe boots have a metal base plate shaped to match the specific panel profile (corrugated, standing seam, etc.) and a flexible EPDM rubber collar that seals around the pipe. The metal base is sealed to the panel with butyl tape and secured with screws for a weathertight penetration.

65. A — A sliding T-bevel set to the roof slope angle marks every panel at the consistent pitch angle. A "pitch gauge" made from two scrap pieces of siding locked at the gable angle provides a quick field template. Either method ensures every angled cut matches the roof slope precisely.

66. C — A manufactured mounting block installed over the housewrap provides a raised, weatherproof base for the electrical box. The siding terminates into the block's integrated J-channel perimeter. The block bridges the siding plane and provides a flat, sealed surface for the weatherproof electrical box.

67. B — Roofing cement is applied at flashing termination points — around pipe boots, step flashing ends, chimney cricket edges, and valley flashing terminals. These transition locations are where shingles meet metal flashing and water is most likely to penetrate. Field shingles rely on their self-seal adhesive.

68. D — Gutter size is determined by the drainage area, the regional rainfall intensity, and the gutter slope. A larger roof area or higher rainfall intensity delivers more water to the gutter per minute. The gutter must be wide and deep enough to handle the peak flow without overflowing during the design storm.

69. A — When fibre cement siding contacts a horizontal trim surface, capillary action draws water upward into the tight joint. The trapped moisture causes the fibre cement to swell and the wood trim to rot. The 6 mm gap breaks the capillary path and allows water to drain freely rather than being drawn into the joint.

70. C — The sill pan must slope outward so water that reaches the pan surface drains toward the exterior by gravity. This is the last defense against water entry at the door threshold — the most vulnerable penetration in the building envelope. An inward-sloping or level pan traps water against the frame.

71. B — Vinyl siding butt joints require a minimum 25 mm (1 inch) overlap. This coverage prevents wind-driven rain from penetrating the joint while accommodating the thermal expansion and contraction of each panel end. The overlap direction should face away from the prevailing wind.

72. D — The head flashing is tucked beneath the shingle courses above the skylight. Water flowing down the roof passes over the shingles, over the flashing, and continues downward past the skylight. This follows the universal water-shedding principle — each upper component laps over the one below.

73. A — When metal lath cups face outward, the mortar scratch coat pushes through the lath mesh and fills the cup spaces behind it. When the mortar hardens, it locks behind the mesh, creating a strong mechanical bond. Cups facing inward (toward the wall) prevent the mortar from keying through the mesh.

74. C — A pop rivet or small screw through both layers at the overlap provides a mechanical connection that prevents the joint from separating as the aluminum expands and contracts with temperature. The sealant alone provides weatherproofing but cannot resist the thermal movement forces indefinitely.

75. B — Without back-priming, the cedar back face absorbs moisture from the wall while the painted front face resists moisture. This differential moisture content causes the board to cup — the wetter back swells while the drier front does not. The cupping pulls the board away from the wall, cracking paint and opening joints.

76. D — Every rain event drives water through the unsealed gap around the gas pipe into the wall cavity. The accumulated moisture saturates the sheathing and framing, causing concealed rot, mould, and structural damage that may not be discovered for years until the damage becomes visible or the wall fails.

77. B — The carpenter shifts the jamb toward the closer wall so the casing reveal is equal on both sides. The wider gap on the offset side is shimmed solidly and insulated with low-expansion foam. This produces a consistent, professional appearance with equal reveals on both sides of the opening.

78. C — Overlapped underlayment edges create a double-thickness ridge that telegraphs through the thin laminate planks as a visible bump. The planks rock on this ridge, causing clicking noises underfoot and eventually damaging the interlocking mechanism at the joints. Edges must be butted flat, not overlapped.

79. B — At least one screw at every stud location across the vanity width provides distributed resistance against the vanity tipping forward when loaded with a countertop, sink, and stored items. Each screw must penetrate at least 32 mm into the stud for adequate withdrawal resistance.

80. D — The 100 mm sphere test is an absolute maximum with no construction tolerance. A 102 mm gap allows a child's head to pass between the balusters, creating a potentially fatal entrapment hazard. An additional baluster or repositioned spacing must reduce every gap to 100 mm or less.

81. B — Crown moulding nailed only into drywall pulls away from the wall over time because the weak gypsum core cannot resist the moulding's weight and the leverage from its angled position. The lower nails must penetrate wall studs and the upper nails must reach ceiling joists or blocking for secure long-term attachment.

82. D — A 20 kg medicine cabinet should be mounted to wall studs for maximum security. If studs are not available at the mounting points, drywall anchors rated for the total load (including dynamic forces from door operation and content access) must be used. Standard drywall screws alone are inadequate.

83. A — A 10 to 12 mm expansion gap provides adequate space for the maximum seasonal width change of hardwood flooring across a typical room. Without this gap, the expanding floor presses against the wall and buckles upward. The baseboard conceals the gap while allowing free movement beneath it.

84. C — The smooth drywall paper face should be primed with a thinset-compatible primer before tile installation. The primer improves the bond between the thinset mortar and the paper surface. Without primer, the thinset may not develop adequate adhesion, and tiles can debond under their own weight.

85. B — The return nosing creates a finished end on the exposed tread by wrapping the nosing profile around the front and side of the tread. This conceals the raw end grain and provides a consistent, continuous nosing profile around the visible edge for both aesthetic appeal and a comfortable tread edge.

86. D — The standard recommendation is approximately 1 CFM per square foot of bathroom floor area, with a minimum of 50 CFM for bathrooms up to 50 square feet. This ventilation rate removes moisture generated by bathing and showering quickly enough to prevent condensation, mould growth, and finish damage.

87. A — The coping saw did not follow the profile closely enough at the bottom, leaving excess material. The carpenter must re-cut the profile, removing more material at the gap location. Back-cutting (angling the saw to remove more material behind the face than at the face) ensures the visible edge fits tightly against the butted piece.

88. C — A 4 mm warp can sometimes be corrected by adjusting hinge mortise depths. Deepening the top hinge mortise pulls the top corner closer to the jamb, while shimming the bottom hinge pushes the bottom away. This effectively twists the door within the frame to counteract the warp. Severe warps require slab replacement.

89. B — Alkali-resistant fibreglass mesh tape embedded in modified thinset mortar reinforces the backer board joints against cracking. Standard paper tape and drywall compound are not moisture-resistant and deteriorate in the wet shower environment. The alkali-resistant system maintains integrity under the alkaline conditions.

90. D — The wood trim was installed at a higher moisture content than the current environment. As the building's HVAC maintained 35% RH, the trim dried and shrank across its width. Crown moulding joints opened as the moulding contracted, and baseboard pulled away from walls as the butt joints separated at inside corners.

91. A — Vinyl tiles manufactured before the mid-1980s — particularly the 9 × 9 inch format — commonly contain asbestos in both the tile and the black mastic adhesive beneath. Breaking, scraping, or grinding these materials releases asbestos fibres. The material must be tested by an accredited laboratory before any disturbance.

92. B — Prolonged water exposure at the toilet location may have damaged the floor joists beneath the subfloor. The carpenter must probe the joist tops for softness, check for mould growth, and verify structural integrity before installing the new subfloor patch. Rotted joists must be sistered or replaced.

93. B — Spray foam or a sill gasket foam fills the irregular gaps between the rough concrete surface and the wood sill plate. The foam expands to seal every void, providing both air sealing and insulation at this critical junction. Batt insulation cannot seal the discrete air leakage paths at this location.

94. D — The carpenter examines multiple indicators: the wall runs perpendicular to joists above, has a beam or bearing below in the basement, has a double top plate, and joists above may lap or splice at the wall line. However, a structural engineer should ultimately confirm the wall's load-bearing status before any removal.

95. A — Pressure-treated sleepers laid flat on the concrete (over a polyethylene moisture barrier) with rigid foam insulation between them and plywood subfloor on top raises the floor level while providing thermal insulation. The combined height is adjusted by selecting appropriate sleeper and plywood thicknesses.

96. C — Every plumbing fixture must have a P-trap that holds a water seal blocking sewer gases from entering the living space. Without a trap, hydrogen sulphide and other toxic gases rise directly from the drain system into the bathroom. The P-trap must be installed by a licensed plumber per the plumbing code.

97. B — Fire-rated doors require fire-rated hardware — locksets, hinges, and closers — that have been tested as part of the complete fire-rated assembly. Non-rated hardware can fail during a fire (the lockset may melt or deform), allowing the door to open and fire to spread through the opening.

98. D — Approved aluminum-to-copper connectors (COPALUM or AlumiConn) create a safe transition at every device connection. These connectors eliminate the high-resistance junction between aluminum wire and copper device terminals that causes overheating. This is the recognized safer alternative to complete rewiring.

99. A — As-built drawings document the actual constructed conditions after renovation, including all changes from approved plans, precise locations of concealed structural members, routing of plumbing and electrical within walls and floors, and any field modifications. These records are essential for future maintenance and renovations.

100. C — The annual inspection covers all caulking joints for cracking, weatherstripping for compression loss, roof flashing for lifted edges, gutters and downspouts for blockages, exterior paint for peeling, foundation grade for settlement, and deck fasteners for looseness. Proactive maintenance catches small issues before they become expensive failures.