PRACTICE EXAM 24: OREGON CCB SIMULATION (80 QUESTIONS)

80 Multiple-Choice Questions | 200 Minutes | Open-Book Format

1. A contractor is hired to construct a new commercial building on a site that previously contained a dry cleaning business. The Phase II environmental assessment confirms soil contamination from perchloroethylene solvents. Before excavation begins, what regulatory clearance must the contractor obtain?

A. A standard building permit from the local jurisdiction is the only clearance needed because the permit process addresses all site conditions
B. Clearance from the Oregon Department of Environmental Quality confirming that the contaminated soil management plan is approved and the contractor may proceed with excavation under the specified protocols
C. A letter from the property owner's insurance company confirming that the environmental liability is covered under the property policy
D. A waiver from OSHA exempting the project from the Hazardous Waste Operations and Emergency Response standard for the excavation

2. A residential contractor in Oregon completes a bathroom remodel and the homeowner pays the final invoice. Eight months later, the shower tile begins falling off the wall due to improper substrate preparation. The homeowner contacts the contractor, who refuses to make repairs claiming the project is complete and paid in full. What recourse does the homeowner have under Oregon law?

A. No recourse because full payment constitutes final acceptance of the work and eliminates all future claims against the contractor
B. The homeowner may file a CCB complaint, pursue a claim against the contractor's surety bond, and potentially file a civil lawsuit because Oregon's implied warranty of workmanlike construction is not waived by payment
C. The homeowner's only option is to hire another contractor and absorb the additional cost as a personal financial loss

D. The homeowner must wait until the one-year anniversary of the project completion before any legal action can be initiated

3. A contractor is managing a commercial project and the structural engineer requires moment frame connections at all beam-to-column joints in the seismic force-resisting system. The steel fabricator delivers beams with standard shear tab connections instead of moment connections. The erector installs the beams before the discrepancy is discovered. What is the structural consequence?

A. Shear tab connections provide equivalent lateral force resistance to moment connections in all seismic design applications
B. The building's gravity load capacity is compromised because shear tabs cannot support the weight of the floor system above
C. The shear tab connections are structurally adequate if the erector installs additional bolts at each connection to increase capacity
D. The building's lateral force-resisting system is fundamentally compromised because shear connections cannot resist the rotational forces that moment connections are designed to transfer during seismic events

4. Under Oregon employment law, a construction employer must comply with the state's sick leave requirements. An employee who has worked for the contractor for three months requests paid sick leave to care for a family member. Is the employer required to provide this leave?

A. No, because sick leave in Oregon applies only to the employee's own illness and not to caring for family members
B. No, because employees must work for at least one year before becoming eligible for any form of sick leave benefits
C. Yes, Oregon's sick leave law generally requires employers to provide sick leave that can be used for the employee's own illness or to care for a family member, with accrual beginning at the start of employment
D. Yes, but only if the employer has more than fifty employees and the family member lives in the same household as the worker

5. A contractor is building a residential home and the plans specify a ground-source heat pump system with vertical bore holes. During drilling, the drill rig encounters an artesian aquifer that produces flowing water at the surface. What is the contractor's immediate obligation?

A. Cap the bore hole with concrete and relocate the ground loop to a horizontal configuration without notifying any regulatory agency

B. Continue drilling through the aquifer because artesian wells are a beneficial source of water for the geothermal heat pump system
C. Notify the homeowner that the ground-source heat pump system cannot be installed on this property under any configuration
D. Stop drilling immediately, secure the flowing well, and notify the Oregon Water Resources Department because artesian aquifer penetration is regulated and the flowing water must be properly controlled

6. A contractor is reviewing a commercial project's mechanical specifications and discovers that the specifications require all HVAC equipment to have a minimum Sound Transmission Class rating for the equipment enclosure. The building is a medical office where patient confidentiality requires sound isolation between examination rooms. What is the primary concern if the HVAC equipment does not meet the specified STC rating?

A. The HVAC system will consume more energy because sound energy is converted to heat within the equipment enclosure
B. The building inspector will reject the mechanical installation because STC ratings are verified during the mechanical inspection
C. The equipment will experience premature bearing failure because internal sound pressure accelerates mechanical wear
D. Sound from the HVAC equipment may transmit through walls and ceilings into examination rooms, compromising patient privacy and violating healthcare facility sound isolation requirements

7. A contractor is building a residential addition and the existing home has a crawl space with a dirt floor. The building code requires a vapor barrier on the crawl space floor. During inspection of the existing crawl space, the contractor discovers standing water approximately two inches deep covering the entire crawl space floor. What should the contractor do before installing the vapor barrier?

A. Install the vapor barrier directly over the standing water because the barrier will contain the water beneath the plastic sheet
B. Identify and address the source of the standing water, install a drainage system or sump pump to remove the water, ensure the crawl space is dry, and then install the vapor barrier over the prepared surface
C. Add two inches of sand over the standing water to create a dry surface and install the vapor barrier on top of the sand layer
D. Seal the crawl space vents to prevent additional water from entering and allow the existing water to evaporate naturally over time

8. A contractor is managing a commercial project and the roofing subcontractor has completed the roof installation. The specifications require the contractor to perform a roof moisture survey before the warranty inspection. What does a roof moisture survey detect?

A. The survey measures the roof membrane's UV degradation level to determine its remaining service life before replacement
B. The survey identifies areas where the roof slope does not meet the minimum drainage requirement specified in the plans
C. The survey identifies areas of trapped moisture within the roof insulation or assembly that could cause premature deterioration, membrane failure, or structural damage if left unaddressed
D. The survey measures the ambient humidity level above the roof surface to determine the optimal time for warranty inspection

9. Under Oregon law, a contractor is hired to build a detached accessory structure on a residential property. The structure will be used as a home office with electrical service, plumbing for a half bathroom, and a mini-split HVAC system. Which permits are typically required for this project?

A. Only a building permit is required because the electrical, plumbing, and mechanical work are included under the general permit
B. Separate building, electrical, plumbing, and mechanical permits are typically required because each trade discipline has its own permit and inspection requirements under Oregon building codes
C. No permits are required for detached accessory structures under five hundred square feet on residential properties in Oregon
D. Only an electrical permit is required because the building permit is waived for structures that do not exceed one story in height

10. A contractor is performing a commercial renovation and the building's existing electrical system uses a bus duct distribution system for the main power feeds. During demolition, the contractor's crew accidentally damages a section of the bus duct. What immediate safety action must the contractor take?

A. Continue demolition work and schedule the bus duct repair for the following week when the electrical subcontractor is available
B. Wrap the damaged section with electrical tape and continue work because bus duct systems are designed to withstand minor damage
C. De-energize the damaged bus duct section immediately, secure the area to prevent worker contact, and notify a qualified electrician to assess the damage and perform repairs before the system is re-energized
D. Spray the damaged area with fire-retardant foam to prevent electrical arcing and continue demolition in adjacent areas

11. A contractor is building a residential home and the plans show a whole-house ventilation system using an energy recovery ventilator. The ERV is connected to the ductwork system and provides balanced ventilation to all occupied spaces. During commissioning, the contractor discovers that the ERV's outdoor air intake is located three feet from the kitchen exhaust outlet. What problem does this proximity create?

A. The proximity has no operational impact because the ERV's internal filters remove all contaminants from the incoming air stream
B. The kitchen exhaust outlet is too close to the ERV intake, which may cause cooking odors, grease, and moisture to be drawn back into the house through the ventilation system, creating a short-circuit of the exhaust air
C. The proximity creates excessive noise at the ERV intake from the kitchen exhaust fan operating during cooking activities
D. The kitchen exhaust reduces the ERV's heat recovery efficiency by lowering the temperature of the incoming outdoor air stream

12. A contractor is reviewing a commercial project's structural plans and the engineer specifies concrete with a maximum water-to-cement ratio of zero-point-four-five for all exterior exposed concrete. What is the purpose of limiting the water-to-cement ratio?

A. A lower water-to-cement ratio increases the concrete's slump, making it easier to place and finish in exterior applications
B. The water-to-cement ratio limit applies only to interior concrete and has no effect on exterior concrete durability performance
C. A lower water-to-cement ratio reduces the concrete's compressive strength, which is preferred for exterior flatwork applications
D. A lower water-to-cement ratio produces denser, less permeable concrete that resists freeze-thaw damage, chloride penetration, and weathering, which is critical for exterior exposed concrete durability

13. A contractor is managing a residential project and discovers that the lumber delivered to the site has a moisture content of twenty-five percent. The specifications require framing lumber to have a moisture content of nineteen percent or less. What problem does using the high-moisture lumber create?

A. High-moisture lumber is stronger than dry lumber because the water content increases the wood fiber's tensile capacity
B. The moisture content has no impact on the framing because all lumber dries to the same moisture level after the house is enclosed

C. High-moisture lumber shrinks significantly as it dries after installation, causing nail pops, drywall cracks, floor squeaks, and potential structural connection loosening throughout the framed structure
D. High-moisture lumber is acceptable for framing as long as the contractor applies a waterproof sealant to all cut ends before installation

14. A contractor is hired to perform a commercial tenant improvement and the lease agreement between the tenant and the landlord specifies that the tenant is responsible for all improvements. The contractor signs a contract with the tenant. During construction, the contractor discovers that the building's existing fire sprinkler system must be modified to accommodate the new layout. Who is responsible for the cost of the sprinkler modification?

A. The fire department is responsible because the sprinkler modification is triggered by a fire code requirement during the renovation
B. The tenant is typically responsible under the lease terms because the tenant agreed to pay for all improvements, and the sprinkler modification is a necessary part of the tenant improvement work
C. The landlord is always responsible for fire sprinkler costs because the sprinkler system is part of the building's base building systems
D. The contractor absorbs the sprinkler modification cost because the contractor should have identified the need during the pre-bid review

15. A contractor is building a residential home and the energy code requires thermal bridging to be addressed at all steel stud wall locations. Why is thermal bridging a concern with steel stud framing?

A. Steel studs conduct heat much more readily than wood studs, creating paths of high heat transfer through the wall assembly that significantly reduce the effective R-value of the insulation installed in the stud cavities
B. Steel studs are thinner than wood studs, which reduces the available cavity depth for insulation and limits the maximum R-value
C. Thermal bridging occurs only at the top and bottom plates and does not affect the heat transfer through the steel stud portion
D. Steel studs expand more than wood studs in heat, creating gaps in the insulation that allow air infiltration through the wall

16. A contractor is managing a commercial project and the specifications require the contractor to install a lightning protection system on the building. The system must comply with NFPA 780. What is the primary purpose of a lightning protection system?

A. To prevent lightning from striking the building by creating an electromagnetic field that deflects lightning bolts away
B. To provide a low-resistance path for lightning current to follow safely to ground, protecting the building structure, electrical systems, and occupants from damage caused by a direct lightning strike
C. To generate backup electrical power from lightning strikes to supplement the building's emergency generator system
D. To protect only the building's telecommunications equipment and data systems from lightning-induced voltage surges

17. A contractor is performing a residential renovation and the existing home has a wood-burning fireplace with a clay tile flue liner. During inspection, the contractor discovers that several clay tiles in the flue liner are cracked and deteriorating. The homeowner wants to continue using the fireplace. What must the contractor do?

A. Seal the cracks with high-temperature silicone caulk and certify the fireplace as safe for continued use after the repair
B. Install a glass fireplace door to contain any sparks that might escape through the cracked liner during fireplace operation
C. Allow continued fireplace use because cracked clay tile liners are a normal condition that does not affect fireplace safety
D. Inform the homeowner that the cracked flue liner is a fire hazard and recommend relining the chimney with a code-compliant liner system before the fireplace is used again

18. A contractor is building a commercial structure and the specifications require all concrete floor slabs to receive a hardener and densifier treatment. What is the purpose of applying a hardener and densifier to a concrete floor slab?

A. To change the color of the concrete surface to match the architect's specified finish palette for the occupied floor areas
B. To reduce the concrete's compressive strength so the surface is softer and more comfortable for workers standing on it
C. To increase the surface hardness, reduce dusting, and improve the abrasion resistance of the concrete floor by chemically reacting with the calcium hydroxide in the concrete to produce a harder, denser surface
D. To create a waterproof membrane on the concrete surface that prevents moisture from penetrating through the slab below

19. Under Oregon law, a contractor enters into a residential construction contract that does not include a dispute resolution clause. A dispute arises between the contractor and the homeowner

over the quality of the exterior paint application. What dispute resolution options are available to both parties?

A. Without a contractual dispute resolution clause, the only option is to file a lawsuit in circuit court for breach of contract
B. The dispute must be submitted to the CCB for binding arbitration because the CCB has exclusive jurisdiction over all residential disputes
C. Both parties may pursue resolution through the CCB complaint process, mediation, arbitration by mutual agreement, or litigation in court
D. The contractor must accept the homeowner's position because the absence of a dispute resolution clause means the homeowner's assessment of quality controls

20. A contractor is estimating a commercial project and needs to calculate the cost of installing a suspended acoustic ceiling in a large open office area. The room measures one hundred twenty feet by eighty feet. The ceiling system costs four dollars and twenty-five cents per square foot for materials installed, plus a fifteen percent markup for overhead and profit. What is the contractor's total bid price for the ceiling?

A. Fifty-five thousand two hundred dollars based on the material and installation cost plus a twenty percent markup miscalculation
B. Forty-six thousand nine hundred twenty dollars based on the room area multiplied by the unit cost plus the fifteen percent markup
C. Forty thousand eight hundred dollars based on the room area multiplied by the unit cost without the overhead and profit markup
D. Fifty-two thousand four hundred forty dollars based on the room area plus a ten percent waste factor multiplied by the unit cost

21. A contractor is building a residential home and the structural plans specify a continuous footing with a minimum width of sixteen inches and a minimum depth of eight inches. The contractor pours the footing at twelve inches wide. During the footing inspection, the inspector measures the width and rejects the installation. What structural concern does the narrower footing create?

A. The twelve-inch footing provides adequate bearing area for all residential construction loads in Oregon's soil conditions
B. The narrower footing has a smaller bearing area that may not adequately distribute the building loads to the soil, potentially exceeding the soil's bearing capacity and causing differential settlement
C. The footing width affects only the volume of concrete used and has no relationship to the structural performance of the foundation
D. The twelve-inch footing is acceptable if the contractor increases the footing depth from eight inches to twelve inches to compensate

22. A contractor is managing a commercial project and the fire protection engineer requires the contractor to install a fire department connection on the exterior of the building. The contractor installs the FDC behind a decorative wall panel that conceals it from view. Why is this installation unacceptable?

A. The FDC is designed to be concealed behind panels to protect it from vandalism and weather exposure during non-emergency use
B. Concealed FDCs function identically to visible ones because fire trucks carry portable connection adapters for hidden locations
C. The FDC must be visible and readily accessible from the street or fire lane so fire department personnel can quickly connect their hoses during an emergency without delays caused by searching for a concealed connection
D. The decorative panel prevents the FDC from draining properly after fire department use, causing the connection to freeze in winter

23. A contractor is performing a residential renovation and the homeowner asks the contractor to install a wood-burning stove in the living room. The contractor must ensure the installation complies with the building code's clearance requirements from combustible materials. What determines the required clearances for the wood-burning stove installation?

A. The building inspector determines the clearances during the installation inspection based on their professional judgment of the room layout
B. The clearances are standardized at thirty-six inches from all combustible materials regardless of the stove model or manufacturer
C. The manufacturer's listing and installation instructions specify the minimum clearances from combustible materials, which must also comply with the applicable building code requirements
D. No clearances are required if the stove is certified by the Environmental Protection Agency for emissions compliance standards

24. A contractor is building a commercial warehouse and the specifications require a vapor barrier beneath the concrete slab on grade. The contractor installs the vapor barrier but places a two-inch sand blinding layer on top of the barrier before pouring the concrete. Some engineers argue against the sand layer over the vapor barrier. What is the concern with placing sand between the vapor barrier and the concrete slab?

A. The sand layer improves the vapor barrier's performance by providing additional moisture protection beneath the concrete slab

B. The sand layer can absorb and retain moisture that becomes trapped between the vapor barrier below and the concrete above, creating a reservoir of water that migrates upward through the slab as it dries
C. The sand layer is always required by the building code and there is no legitimate engineering concern with this standard practice
D. The sand layer prevents the concrete from bonding to the vapor barrier which is beneficial for slab movement during settlement

25. Under Oregon law, a contractor completes a residential project and the homeowner signs a completion certificate indicating satisfaction with the work. Three years later, the homeowner discovers that the foundation has a major structural crack caused by the contractor's failure to install the specified reinforcement during construction. Can the homeowner pursue a claim despite signing the completion certificate?

A. No, the completion certificate permanently bars all future claims against the contractor regardless of when defects are discovered
B. No, because the three-year discovery period exceeds the one-year limit for all construction defect claims under Oregon law
C. Yes, but only if the homeowner can prove that the contractor intentionally concealed the missing reinforcement from inspection
D. Yes, because the completion certificate does not waive claims for latent defects that were concealed and not discoverable at the time of sign-off, and the missing reinforcement constitutes a latent defect

26. A contractor is installing a commercial building's fire alarm system and the specifications require manual pull stations at every exit from the building. The contractor installs pull stations at the main entrance and the rear exit but omits them at three side exit doors. What fire and life safety deficiency does this create?

A. Pull stations at only the main exits are sufficient because side exits are classified as secondary egress and are exempt from pull station requirements
B. The omission has no safety impact because automatic smoke detectors throughout the building provide fire alarm activation without manual pull stations
C. Building occupants near the side exits cannot manually activate the fire alarm system if they discover a fire, potentially delaying notification and evacuation
D. Pull stations are required only at exits serving assembly occupancies and are optional at all other exit locations in commercial buildings

27. A contractor is building a residential addition and the plans require the installation of a structural ridge beam instead of a conventional ridge board. The ridge beam eliminates the need

for ceiling joists or rafter ties. The contractor installs a conventional ridge board without ceiling joists or rafter ties. What structural failure mode does this create?

A. The roof structure will resist all loads normally because the ridge board provides the same structural support as the ridge beam
B. Without ceiling joists or rafter ties, the rafters have no mechanism to resist outward thrust at the wall plates, and the ridge board cannot support the gravity loads, causing the walls to spread apart and the ridge to sag
C. The conventional ridge board provides adequate support for the rafters as long as the contractor installs additional collar ties
D. The roof structure functions normally until snow loads exceed twenty pounds per square foot, at which point the ridge deflects

28. A contractor is managing a commercial project and discovers that the concrete placement crew left a cold joint in a structural beam by stopping the pour for ninety minutes while waiting for the next concrete truck. The concrete at the joint had begun initial set before the fresh concrete was placed. What structural concern does this cold joint create?

A. The cold joint creates a plane of weakness where the hardened and fresh concrete did not bond properly, potentially reducing the beam's shear and flexural capacity at the joint location
B. Cold joints in structural beams are acceptable if the concrete achieves the specified twenty-eight-day compressive strength overall
C. The cold joint improves the beam's performance by creating a natural expansion joint that accommodates thermal movement
D. Cold joints affect only the beam's appearance and have no structural consequence for the load-carrying capacity of the member

29. A contractor is performing a residential renovation and the homeowner wants to convert the attached garage into a living space. Under Oregon building codes, what code requirements must be met for this conversion?

A. The garage conversion requires only a change of paint color on the walls and installation of carpet over the existing concrete floor
B. The conversion must address insulation, heating, ventilation, electrical outlets, egress windows, smoke alarms, and the removal or relocation of any fuel-burning appliance venting, plus compliance with all applicable residential building code requirements
C. No building permit is required for converting an attached garage to living space because the space is already enclosed by the building
D. The conversion requires only the installation of a smoke alarm and the addition of drywall to the garage ceiling without further modifications

30. Under Oregon tax law, a contractor who is a sole proprietor must pay estimated quarterly tax payments if the annual tax liability is expected to exceed a specified threshold. What is the consequence of failing to make required estimated quarterly tax payments?

A. The contractor may be assessed penalties and interest on the underpaid amount for each quarter that the estimated payments were not made as required
B. No penalty is assessed because sole proprietors are exempt from estimated quarterly payment requirements under Oregon tax law
C. The penalty applies only if the contractor's annual income exceeds five hundred thousand dollars in gross construction revenue
D. The contractor receives a warning letter but no financial penalty is assessed for the first year of missed estimated payments

31. A contractor is building a commercial structure and the structural plans show steel deck with concrete fill on the upper floors. The steel deck acts as both the form for the concrete pour and the tension reinforcement for the composite slab. During placement, the concrete crew uses a vibrator that is too powerful for the deck gauge, causing the deck to deflect excessively and pool the concrete in the low spots. What structural problem does this create?

A. The uneven concrete distribution creates varying slab thicknesses that alter the designed composite section properties, potentially causing areas of inadequate structural capacity where the slab is too thin
B. The pooled concrete improves the slab's performance by creating thicker sections in the most highly loaded areas of the floor
C. The deck deflection has no structural consequence because the concrete fill compensates for any variations in the deck profile
D. The vibrator damage affects only the underside appearance of the deck and has no impact on the structural capacity above

32. A contractor is reviewing the project closeout requirements for a commercial building. The specifications require the contractor to provide record drawings. What is the difference between record drawings and as-built drawings?

A. Record drawings and as-built drawings are identical terms that describe the same final documentation deliverable for the project
B. Record drawings are produced during the design phase while as-built drawings are produced during construction documentation
C. Record drawings show only the architectural changes while as-built drawings show only the structural and mechanical changes

D. Record drawings are the architect's updated design documents incorporating the contractor's field markups, while as-built drawings are the contractor's marked-up field set showing actual installed conditions

33. A contractor is building a residential home and the plans specify a minimum R-thirty-eight ceiling insulation. The contractor installs R-thirty fiberglass batts in the attic. The energy inspector rejects the installation. By what percentage does the installed insulation fall short of the specified R-value?

A. The installed R-thirty insulation falls approximately twenty-one percent short of the specified R-thirty-eight requirement
B. The installed insulation exceeds the requirement because R-thirty is within the acceptable tolerance range for R-thirty-eight
C. The shortfall is exactly eight percent because the difference between R-thirty and R-thirty-eight is eight R-value units
D. The shortfall cannot be calculated without knowing the insulation thickness and density specifications for the specific product

34. A contractor is managing a commercial project and the owner requests that the contractor provide a project cash flow analysis. What does a cash flow analysis show the project owner?

A. The total profit the contractor will earn on the project calculated as the difference between the contract price and actual costs
B. The timing and amount of anticipated expenditures and income throughout the project duration, enabling the owner to plan financing draws and ensure adequate funds are available when progress payments are due
C. The contractor's credit score and financial stability assessment performed by an independent accounting firm for the lender
D. The real estate market value of the completed building compared to the total construction cost including all change orders

35. A contractor is installing a residential heat pump and the mechanical plans specify a minimum clearance around the outdoor condensing unit for adequate airflow and service access. The contractor installs the unit in a corner with fencing on two sides, reducing the clearance to six inches on those sides. The manufacturer requires a minimum twenty-four-inch clearance. What operational problem does this create?

A. The reduced clearance has no impact because the unit draws air from the top and does not require side clearance for airflow

B. The six-inch clearance affects only the noise level of the condensing unit and does not impact heating or cooling performance
C. Restricted airflow around the condensing unit reduces the system's efficiency, increases operating costs, may cause the compressor to overheat and fail prematurely, and prevents service technicians from accessing the unit for maintenance
D. The reduced clearance affects only the manufacturer's warranty and does not impact the unit's operational performance or lifespan

36. Under Oregon employment law, an employer must provide rest periods to employees. A contractor's foreman instructs workers to skip their rest periods to meet a project deadline. The foreman tells the workers they will receive extra pay instead of taking rest breaks. Is this practice legal under Oregon law?

A. Yes, because employees may voluntarily waive rest periods in exchange for additional compensation at any time during the shift
B. No, Oregon law requires employers to provide rest periods and they cannot be waived or exchanged for additional pay, and the foreman's instruction violates the state's rest period requirements
C. Yes, but only if the additional pay equals at least double the employee's regular hourly rate for each skipped rest period
D. Yes, because construction workers are classified as outdoor laborers and are exempt from rest period requirements in Oregon

37. A contractor is building a commercial structure and the plans require the installation of a stormwater quality treatment system consisting of a hydrodynamic separator followed by a biofiltration system. During construction, the contractor installs only the hydrodynamic separator and omits the biofiltration system. What regulatory concern does this create?

A. The hydrodynamic separator alone provides adequate stormwater treatment and the biofiltration system is a redundant secondary treatment
B. The omission affects only the project's LEED certification points and has no regulatory impact on the stormwater management system
C. The biofiltration system is an aesthetic feature that improves the landscaping appearance and has no stormwater treatment function
D. The hydrodynamic separator has no impact because only biofiltration systems are required by the stormwater regulations in Oregon

38. A contractor is performing a commercial renovation in an occupied building and must maintain the building's existing fire alarm system in operation throughout the construction period. The contractor's crew triggers the fire alarm multiple times during demolition work due

to dust activation of the smoke detectors. The building manager requests the contractor to disconnect the fire alarm system for the duration of the project. Should the contractor comply with this request?

A. Yes, because frequent false alarms desensitize building occupants and disconnecting the system prevents alarm fatigue
B. Yes, because the building manager has the authority to authorize the system shutdown as the building's responsible party
C. Yes, if the contractor installs a temporary battery-operated smoke alarm near the construction area as a substitute system
D. No, the contractor should not disconnect the fire alarm system but should instead implement dust control measures, install detector covers or temporary detector replacements approved by the fire marshal, and maintain fire watch procedures

39. A contractor is building a residential deck and the building code requires all fasteners used in pressure-treated lumber to be corrosion-resistant. The contractor uses stainless steel screws for all deck board connections but uses standard zinc-plated joist hangers at the structural connections. Are the zinc-plated joist hangers acceptable with the pressure-treated lumber being used?

A. Zinc-plated joist hangers are always acceptable with all types of pressure-treated lumber regardless of the preservative treatment
B. Stainless steel is the only acceptable material for all fasteners and connectors used with any type of pressure-treated lumber
C. The acceptability depends on the specific pressure-treated lumber preservative type, because certain copper-based preservatives accelerate corrosion of standard zinc-plated connectors, potentially requiring hot-dipped galvanized or stainless steel connectors
D. Zinc-plated joist hangers are only a concern in coastal environments and are acceptable for all inland residential deck applications

40. A contractor is managing a commercial project and the architect issues a supplemental instruction changing the interior paint color from the specified light gray to a custom dark blue. The custom color requires two additional coats for full coverage compared to the light gray. Under standard AIA contract terms, is the contractor entitled to additional compensation for the extra coats?

A. Yes, because the additional coats represent additional work that was not included in the original contract scope, and the contractor is entitled to a change order for the labor and material costs of the additional coats required to achieve the specified coverage
B. No, because paint color changes are considered minor field adjustments that do not affect the contract price under any circumstances

C. Yes, but only if the total cost of the additional coats exceeds one thousand dollars for the entire project painting scope
D. No, because the contractor's bid should have included a contingency for paint coverage variations across the full color spectrum

41. A contractor is building a residential home and the plans require a mechanical ventilation system to meet the energy code's indoor air quality requirements. The contractor installs bathroom exhaust fans as the sole source of mechanical ventilation. Under the energy code, do bathroom exhaust fans alone satisfy the whole-house ventilation requirement?

A. Bathroom exhaust fans alone always satisfy the whole-house ventilation requirement for all residential building code applications
B. Bathroom exhaust fans can never be used as part of a whole-house ventilation strategy under any residential energy code edition
C. Bathroom exhaust fans may be used as the exhaust component of a whole-house ventilation strategy if they are rated for continuous operation and provide the required airflow rate, though additional provisions for makeup air may be needed depending on the code
D. Bathroom exhaust fans satisfy the requirement only if the home is smaller than fifteen hundred square feet in total conditioned area

42. A contractor is reviewing a commercial project's structural plans and the engineer specifies headed stud anchors welded to the top flange of steel beams for composite action with the concrete slab. The contractor welds the studs to the bottom flange instead of the top flange. What structural consequence does this error create?

A. Welding studs to the bottom flange provides the same composite action as welding them to the top flange in all loading conditions
B. The bottom-flange studs improve the beam's fire resistance by providing a heat sink that slows the temperature rise in the steel
C. The bottom-flange studs reduce the beam's deflection more effectively than top-flange studs in composite beam applications
D. The studs on the bottom flange cannot engage the concrete slab above the beam, eliminating the composite action between the steel beam and the concrete slab that the structural design depends on for load capacity and stiffness

43. Under Oregon law, a contractor hires a worker and the worker signs an independent contractor agreement. However, the contractor provides all tools, sets the daily schedule, directs the methods of work, and pays the worker a fixed hourly rate. Based on Oregon's worker classification tests, how should this worker be classified?

A. As an employee because the contractor's behavioral and financial control over the worker satisfies the criteria for employee classification regardless of the signed independent contractor agreement
B. As an independent contractor because the signed agreement establishes the legal relationship between the parties conclusively
C. As a temporary employee who transitions to independent contractor status after the first ninety days of continuous work
D. As an independent contractor because the hourly rate payment method is the determining factor for worker classification in Oregon

44. A contractor is installing a commercial building's plumbing system and the plans show a grease interceptor serving the kitchen area. The specifications require the interceptor to be sized based on the fixture unit count and the flow rate from the kitchen fixtures. The contractor installs an undersized interceptor. What operational problem will this cause?

A. The undersized interceptor will efficiently trap all grease because smaller units create faster water flow that improves separation
B. The interceptor size has no impact on grease removal efficiency because all interceptors use the same separation technology
C. The undersized interceptor will improve kitchen drainage because smaller units have lower flow resistance than larger units
D. The undersized interceptor cannot adequately separate grease from the wastewater flow, causing grease to pass through to the sanitary sewer, potentially violating discharge regulations and causing sewer line blockages

45. A contractor is managing a residential project and the building inspector requires a final electrical inspection before the certificate of occupancy can be issued. During the inspection, the inspector discovers that several outlets in the kitchen are not GFCI-protected. Under the National Electrical Code, which kitchen outlets require GFCI protection?

A. Only outlets located within three feet of the kitchen sink require GFCI protection under the residential electrical code
B. Only outlets on the dedicated twenty-ampere small appliance circuits require GFCI protection in the kitchen area
C. GFCI protection is optional for kitchen outlets in residential construction and is required only in commercial kitchen installations
D. All receptacle outlets serving kitchen countertop surfaces require GFCI protection to protect occupants from electrical shock in the wet kitchen environment

46. A contractor is building a commercial structure and the fire code requires the installation of photoluminescent exit path markings in the exit stairways of high-rise buildings. What is the purpose of photoluminescent exit path markings?

A. To improve the aesthetic appearance of the exit stairways by providing a decorative accent along the stair treads and handrails
B. To provide daytime visibility of the exit path for building occupants who use the stairways for normal inter-floor circulation
C. To provide visible wayfinding guidance in exit stairways during power outages or smoke-filled conditions when normal lighting and emergency lighting may be obscured, using self-luminous markings that glow without electrical power
D. To identify exit stairways as fire department access routes and distinguish them from general circulation stairways in the building

47. A contractor is reviewing a commercial project's mechanical specifications and the engineer requires the installation of seismic restraints on all suspended mechanical equipment weighing more than a specified threshold. The contractor installs the equipment without seismic restraints. What is the potential consequence during a seismic event?

A. Unrestrained suspended equipment can swing, break free from its supports, and fall, creating a falling object hazard for building occupants and potentially rupturing piping or ductwork connections that could release water, refrigerant, or cause system failure
B. Seismic restraints are optional design enhancements that improve the equipment's operating efficiency but are not code requirements
C. The equipment remains stable during seismic events because the suspension hardware is designed to resist all lateral forces
D. Seismic restraints are required only in seismic design categories E and F, which do not include any locations within Oregon

48. A contractor is building a residential home and the plans specify insulated concrete form walls for the foundation. The ICF manufacturer requires the concrete to be placed in lifts not exceeding four feet at a time to prevent blowouts. The contractor's crew pours the full eight-foot wall height in a single lift. What is the risk of this pour method?

A. The single-lift pour produces a stronger wall because the concrete consolidates more uniformly without lift lines between pours
B. The excessive concrete pressure from the full-height pour can cause the ICF forms to bulge or blow out, resulting in concrete spills, wall misalignment, and potentially dangerous form failure
C. The single-lift pour is preferred because it eliminates the cold joint between lifts that would weaken the wall's structural capacity

D. The pour method has no impact on the wall quality because ICF forms are designed to withstand full-height concrete placement

49. Under Oregon law, a contractor is required to maintain workers' compensation insurance for all employees. A sole proprietor with no employees elects the exemption from workers' compensation coverage. The sole proprietor then hires one part-time laborer to help on a residential project. What is the contractor's obligation regarding workers' compensation for this laborer?

A. The contractor must immediately obtain workers' compensation insurance coverage for the part-time laborer because Oregon law requires coverage for all employees, and the sole proprietor's personal exemption does not extend to hired workers
B. The part-time laborer is automatically covered under the sole proprietor's personal exemption as long as they work fewer than twenty hours per week
C. Part-time laborers on residential projects are exempt from workers' compensation requirements regardless of the hours worked
D. The contractor may delay obtaining coverage for thirty days to evaluate whether the laborer will become a permanent employee

50. A contractor is managing a commercial project and the specifications require the contractor to perform a commissioning verification of the building automation system. The commissioning agent discovers that the HVAC system's economizer controls are not functioning properly. The economizer dampers remain closed when outdoor temperatures are suitable for free cooling. What energy impact does this malfunction have?

A. The malfunctioning economizer has no energy impact because the building's mechanical cooling system compensates automatically
B. The closed economizer dampers cause the HVAC system to use mechanical cooling when free outdoor air could be used, wasting the energy savings that the economizer is designed to provide
C. The malfunctioning economizer wastes energy by bringing in excessive outdoor air that must be heated or cooled to the supply temperature
D. The closed dampers cause the building to overheat because no outdoor air is supplied to the occupied spaces for ventilation

51. A contractor is building a residential addition and the structural engineer specifies a specific type of anchor bolt for the sill plate connection. The specification calls for half-inch-diameter anchor bolts embedded seven inches into the concrete at six feet on center maximum. The contractor installs three-eighths-inch anchor bolts at the specified spacing. What structural concern does the undersized bolt create?

A. The three-eighths-inch bolt provides adequate capacity for residential sill plate connections and the size difference has no structural impact
B. The undersized bolt affects only the bolt's corrosion resistance and has no impact on the connection's structural load capacity
C. The three-eighths-inch bolt is preferred because smaller bolts are less likely to split the sill plate during installation and tightening
D. The bolt diameter is reduced, which has no impact on the structural design if the embedment depth and spacing remain unchanged

52. A contractor is reviewing a commercial project's fire protection plans and the engineer specifies a dry pipe sprinkler system for an unheated warehouse. How does a dry pipe system differ from a standard wet pipe system?

A. A dry pipe system uses a different type of sprinkler head that is specifically designed for cold temperature activation
B. A dry pipe system has larger pipe diameters to compensate for the reduced water pressure caused by the dry pipe valve
C. A dry pipe system keeps the piping filled with pressurized air or nitrogen instead of water, and water enters the piping only when a sprinkler head activates and releases the air pressure, preventing pipe freezing in unheated spaces
D. A dry pipe system uses heated water that is maintained at one hundred forty degrees to prevent freezing in cold environments

53. A contractor is performing a residential renovation and discovers that the existing home has a Federal Pacific Electric panel with Stab-Lok circuit breakers. The homeowner is unaware of any issues with the panel. What should the contractor advise?

A. Federal Pacific panels are modern designs that meet all current electrical safety standards and require no special attention
B. The panel is safe as long as the breakers have been replaced within the last five years with matching replacement components
C. Federal Pacific panels are preferred by electricians because the Stab-Lok breakers provide superior overcurrent protection performance
D. Federal Pacific Stab-Lok panels have a well-documented history of breakers failing to trip during overcurrent conditions, creating a fire hazard, and the contractor should advise the homeowner to have the panel evaluated by a licensed electrician and consider replacement

54. A contractor is building a commercial structure and the mechanical plans specify a variable frequency drive on the HVAC system's air handling unit supply fan motor. What is the primary energy-saving function of a variable frequency drive?

A. The VFD increases the fan motor's horsepower during peak demand periods to provide additional cooling capacity when needed
B. The VFD converts the building's single-phase power to three-phase power for the fan motor, improving electrical efficiency
C. The VFD adjusts the fan motor speed to match the actual airflow demand, reducing energy consumption during partial-load conditions instead of running the fan at full speed and throttling the airflow with dampers
D. The VFD provides backup power to the fan motor during utility power outages, ensuring continuous HVAC operation at all times

55. A contractor is managing a residential project and the homeowner asks whether the contractor is required to provide a written warranty on the completed work. Under Oregon law, what warranty obligation does the contractor have?

A. Oregon law implies a warranty of workmanlike construction on residential projects regardless of whether the contract includes express warranty terms, meaning the work must be performed with the skill and care of a reasonably competent contractor
B. No warranty obligation exists unless the contract specifically includes written warranty terms signed by both parties at closing
C. The contractor's warranty obligation ends upon the homeowner's acceptance of the completed work and final payment
D. Oregon law provides only a thirty-day implied warranty on residential construction work measured from the completion date

56. A contractor is building a commercial parking garage and the structural plans specify post-tensioned concrete for the elevated floor slabs. The post-tensioning tendons are stressed after the concrete achieves the minimum specified compressive strength. What happens if the tendons are stressed before the concrete reaches the required strength?

A. Early stressing has no impact because the tendons apply only compressive forces that concrete can resist at any strength level
B. The tendons cannot be stressed before the concrete reaches strength because the stressing equipment will not function properly
C. Early stressing is preferred because it reduces the total construction time and accelerates the floor-to-floor construction cycle
D. The concrete may crack, crush, or spall at the anchorage zones and along the tendon profile because it lacks sufficient strength to resist the concentrated compression forces applied during stressing

57. A contractor is performing a commercial renovation and the building code requires the contractor to install area of refuge locations in the building for occupants who cannot use the stairs during an emergency evacuation. What is an area of refuge?

A. A designated room where building occupants store their personal emergency supplies including food, water, and flashlights
B. A secure storage room where the building's emergency equipment and first aid supplies are maintained during normal operations
C. A break room designated for fire department personnel to use as a staging area during emergency operations in the building
D. A fire-rated space with direct access to an exit stairway where occupants who cannot use stairs can wait safely for emergency personnel assistance during an evacuation

58. A contractor is building a residential home and the energy code requires the building envelope to meet specific air tightness standards verified by a blower door test. During the test, the result shows seven air changes per hour at fifty pascals of pressure. The energy code requires a maximum of three air changes per hour. What must the contractor do?

A. The seven ACH50 result is within the acceptable tolerance and no corrective action is required for the blower door test
B. Install a more powerful HVAC system to compensate for the excess air leakage through the building envelope assembly
C. Identify and seal the major air leakage paths including penetrations, framing connections, window and door frames, and duct boot connections, then retest until the air tightness meets the three ACH50 code requirement
D. Apply additional exterior insulation to compensate for the thermal performance lost through the excess air infiltration rate

59. Under Oregon law, a contractor enters into a cost-plus contract with a homeowner for a residential renovation. The contract specifies that the contractor will be reimbursed for all direct costs plus a fee of twelve percent for overhead and profit. During the project, the contractor purchases personal items on the project's material account and includes them in the cost reimbursement invoices. What legal issue does this create?

A. The contractor's action may constitute fraud because charging personal expenses to the project account misrepresents the actual project costs and violates the contractor's fiduciary obligation under the cost-plus contract
B. No legal issue exists because the twelve percent fee compensates for any incidental personal purchases made during the project

C. The practice is acceptable if the personal items cost less than five hundred dollars because small purchases are considered overhead
D. The homeowner must review every receipt before payment, and any overlooked personal charges become the homeowner's expense

60. A contractor is managing a commercial project and the structural engineer requires the contractor to submit concrete cylinder test results at seven days and twenty-eight days for all structural concrete placements. The twenty-eight-day test results for a foundation wall show a compressive strength of thirty-two hundred psi. The specifications require a minimum of four thousand psi at twenty-eight days. What must the contractor do?

A. Accept the results because thirty-two hundred psi is within the acceptable tolerance range for four-thousand-psi specified concrete
B. Apply a surface hardener to the foundation wall to increase the concrete's compressive strength to the specified four thousand psi
C. Request a re-test at fifty-six days because concrete continues to gain strength and may reach the specified value at a later age
D. Notify the structural engineer of the deficient test results, and the engineer will determine whether the concrete is adequate for the actual loads or whether corrective action such as core testing, load testing, or removal and replacement is required

61. A contractor is building a residential home and the plans call for a three-car garage with a twenty-four-foot-wide garage door opening. The structural engineer specifies a steel beam above the garage door opening to carry the roof and wall loads above. The contractor substitutes a built-up lumber header instead of the specified steel beam. What is the structural concern?

A. Built-up lumber headers and steel beams provide identical load-carrying capacity for all residential garage door openings
B. The lumber header provides more flexibility than the steel beam which is beneficial for absorbing movement above the garage door
C. Built-up lumber headers are preferred for garage door openings because they simplify the framing connections at the jamb posts
D. A twenty-four-foot span typically exceeds the capacity of built-up lumber headers, and the steel beam was specified because it can carry the required loads over this wide span without excessive deflection

62. A contractor is reviewing a commercial project's electrical plans and the engineer specifies a harmonic filter on the building's main electrical service. What is the purpose of a harmonic filter in a commercial electrical system?

A. The filter prevents lightning-induced voltage surges from entering the building's electrical system through the utility service feed
B. The harmonic filter reduces the harmonic distortion caused by nonlinear electrical loads such as variable frequency drives, computers, and LED lighting, which can cause overheating of transformers, neutral conductors, and other equipment
C. The filter amplifies the electrical signal to boost voltage at distant receptacles that experience voltage drop from long wire runs
D. The harmonic filter converts the building's single-phase power to three-phase power for operating large commercial HVAC motors

63. A contractor is building a residential addition and the existing home has a two-pipe hydronic heating system with cast iron baseboard radiators. The addition will use the same heating system extended from the existing boiler. The contractor connects the new baseboard radiators but does not balance the hydronic system after the extension. What operational problem does this create?

A. The unbalanced system heats all zones equally because hydronic systems self-balance through the natural tendency of water to equalize
B. The system operates normally because modern circulators compensate for additional piping without requiring manual balancing adjustments
C. The unbalanced system affects only the noise level of the circulators and has no impact on the heat distribution throughout the building
D. The new radiators may receive insufficient hot water flow because the existing radiators create a path of least resistance, resulting in the addition being underheated while the existing rooms may overheat

64. Under Oregon law, a contractor builds a speculative home and lists it for sale. A buyer purchases the home and three months later discovers that the roof has a significant leak at a valley intersection caused by improper flashing installation. The contractor's real estate agent told the buyer the roof was in excellent condition. What liability does the contractor face?

A. The contractor may face liability for construction defects under the implied warranty of workmanlike construction and potentially for misrepresentation through the agent's statements about the roof condition
B. No liability exists because the buyer's home inspector should have identified the flashing defect during the pre-purchase inspection
C. The contractor's liability is limited to the cost of the flashing repair only and does not extend to any resulting interior water damage
D. The real estate agent bears sole liability because the agent made the representation about the roof condition to the buyer

65. A contractor is managing a commercial project and the building automation system integrator requires the contractor to install network cabling throughout the building for the building management system. The cabling will connect all HVAC controls, lighting controls, and energy monitoring equipment. Under Oregon electrical codes, who is authorized to install this low-voltage network cabling?

A. Only a licensed electrician may install any wiring including low-voltage network cabling in commercial buildings under Oregon law
B. Only the building automation system manufacturer may install their proprietary cabling because the system warranty requires it
C. Low-voltage network cabling for building automation systems may be installed by qualified technicians or contractors holding the appropriate limited energy license or exemption, as the specific licensing requirements depend on Oregon's electrical regulations
D. Any construction laborer may install low-voltage cabling because it is classified as non-electrical work exempt from licensing

66. A contractor is building a commercial structure and the specifications require the exterior concrete to be air-entrained for freeze-thaw durability. The contractor's concrete supplier delivers non-air-entrained concrete for the exterior sidewalk pour. The contractor proceeds with the pour without checking the batch ticket. Two winters later, the sidewalk surface begins scaling and spalling. What caused the deterioration?

A. The scaling was caused by the contractor's failure to apply a surface sealer after the concrete cured rather than the air entrainment issue
B. The deterioration was caused by the use of deicing salts and would have occurred even with properly air-entrained concrete
C. The non-air-entrained concrete was too strong and the high compressive strength caused the surface to crack under thermal stress
D. Non-air-entrained concrete lacks the microscopic air bubbles that accommodate the expansion of freezing water within the concrete matrix, causing the surface to scale and spall during repeated freeze-thaw cycles

67. A contractor is performing a residential renovation and the homeowner asks the contractor to install a gas-fired generator in the garage. Under Oregon building codes, what special requirement applies to the installation of a fuel-burning generator inside a garage?

A. Gas-fired generators are prohibited from installation inside residential garages under all Oregon building code editions
B. The generator may be installed in the garage if it is located in the corner farthest from the garage door opening

C. The generator requires only a standard electrical connection and no special combustion air or exhaust venting considerations
D. The generator must have adequate combustion air supply, proper exhaust venting to the exterior, and must comply with clearance requirements from combustible materials and the garage's fire separation provisions

68. A contractor is managing a commercial project and the roofing subcontractor discovers that the structural steel purlins are not aligned properly to receive the metal roof panels. The purlin spacing varies by up to two inches from the specified layout. What should the contractor do?

A. Install the metal roof panels on the misaligned purlins because the panels can span the variation without affecting their structural capacity
B. Notify the structural engineer to evaluate the purlin misalignment and determine whether the purlins must be relocated, shimmed, or if the roof panel attachment can be modified to accommodate the variation
C. Add additional purlins between the existing ones to reduce the effective span and compensate for the spacing misalignment
D. Replace all purlins with a heavier gauge that can support the roof panels at the wider-than-specified spacing without modification

69. A contractor is building a residential home and the plans specify a sealed crawl space with rigid foam insulation applied to the interior face of the foundation walls. The contractor installs the rigid foam but does not protect the exposed foam with a thermal barrier as required by the fire code. What fire safety concern does this create?

A. Rigid foam insulation does not burn and does not require any fire protection regardless of the installation location or application
B. The exposed foam is only a concern in commercial buildings and does not require a thermal barrier in residential crawl spaces
C. Exposed rigid foam insulation can ignite and produce toxic smoke during a fire, and the fire code requires a thermal barrier such as gypsum board to protect the foam from ignition and limit its contribution to a fire event
D. The thermal barrier is required only for foam insulation thicker than two inches and thinner installations are exempt from protection

70. Under Oregon law, a contractor who operates as an LLC must designate a responsible managing individual on the CCB license. What is the role of the responsible managing individual?

A. The RMI serves as the designated person responsible for the contractor's construction activities and compliance with Oregon's contractor licensing laws, and must meet the CCB's qualification requirements
B. The RMI is a silent financial partner who provides capital to the LLC but has no responsibility for construction operations
C. The RMI is the LLC's registered agent for service of legal process and has no involvement in construction activities
D. The RMI serves only as the company's tax preparer and files all business tax returns with the Oregon Department of Revenue

71. A contractor is managing a commercial project and the specifications require the building to achieve a specific energy use intensity target measured in kBTU per square foot per year. The commissioning agent's energy model shows the building will exceed the target by fifteen percent. What should the contractor do?

A. Accept the energy model results because the energy target is an aspirational goal and not an enforceable contract requirement
B. Reduce the building's HVAC operating hours to lower the energy use intensity to match the specified target artificially
C. Increase the building's square footage calculation to reduce the per-square-foot energy intensity without changing the systems
D. Work with the mechanical engineer and commissioning agent to identify energy conservation measures that can bring the building's projected energy use within the specified target

72. A contractor is building a residential home and the plans specify a minimum concrete compressive strength of three thousand psi for the garage floor slab. The contractor orders twenty-five-hundred-psi concrete to reduce costs. The slab is placed and finished. Six months later, the garage floor shows surface wear and dusting in the vehicle traffic areas. What caused the premature deterioration?

A. The surface wear was caused by the contractor's finishing technique and would have occurred regardless of the concrete strength
B. The twenty-five-hundred-psi concrete has lower surface hardness and abrasion resistance than the specified three-thousand-psi mix, resulting in premature wear and dusting under the mechanical action of vehicle tires on the garage floor surface
C. All garage floors develop surface dusting within the first year regardless of the concrete mix strength or finishing technique used
D. The deterioration was caused by the application of deicing salts from vehicles and would have occurred with any concrete strength

73. A contractor is performing a commercial renovation and the architect specifies a specific fire-rated glazing system for the corridor windows. The contractor installs standard tempered glass instead of the specified fire-rated glazing. During the fire inspection, the fire marshal rejects the installation. Why does standard tempered glass not satisfy the fire-rated glazing requirement?

A. Tempered glass provides the same fire resistance as fire-rated glazing because both types prevent flame passage during a fire event
B. Standard tempered glass shatters and falls out of the frame during a fire, creating an opening that allows fire and smoke to pass through the rated wall assembly, defeating the fire separation
C. Tempered glass is rejected only because it does not carry the correct label, and the performance is identical to fire-rated products
D. Standard tempered glass blocks fire for thirty minutes before failure, which meets the minimum requirement for corridor glazing

74. A contractor is building a commercial structure and the specifications require the contractor to install a continuous air barrier system on the building exterior. The air barrier must be tested to demonstrate compliance with the specified air leakage rate. What is the primary purpose of the air barrier system?

A. To control the unintended movement of air through the building envelope, reducing energy consumption from infiltration and exfiltration, preventing moisture condensation within wall cavities, and improving indoor air quality
B. To provide structural bracing for the exterior wall framing by adding a rigid sheet material to the outside of the wall assembly
C. To serve as the primary waterproofing barrier that prevents rainwater from penetrating through the exterior wall cladding system
D. To provide the specified thermal resistance by adding an insulating layer to the exterior of the wall framing at all stud locations

75. A contractor is managing a residential project and the homeowner wants to install a swimming pool with a pool heater. The pool heater will be gas-fired and located outdoors adjacent to the pool equipment pad. Under Oregon mechanical codes, what venting requirement applies to an outdoor gas-fired pool heater?

A. All gas-fired pool heaters require a full chimney vent system extending at least three feet above the highest point of the roof
B. Outdoor gas-fired pool heaters require a horizontal vent pipe extending at least ten feet from any building opening or air intake
C. Indoor venting requirements apply equally to outdoor pool heaters and a category three stainless steel vent pipe is always needed

D. Many outdoor gas-fired pool heaters are designed for outdoor installation without a traditional vent system because the combustion gases exhaust directly to the open atmosphere, though the installation must comply with clearance requirements from buildings and openings

76. A contractor is building a commercial structure and the fire protection plans require the installation of a kitchen hood fire suppression system separate from the building's main sprinkler system. What type of fire suppression system is typically used for commercial kitchen hoods?

A. A standard wet-pipe sprinkler system with additional heads mounted inside the hood exhaust duct for grease fire protection
B. A carbon dioxide total-flooding system that fills the entire kitchen with CO2 to displace oxygen and suppress grease fires
C. A wet chemical fire suppression system that discharges a potassium-based agent specifically designed to suppress grease fires by creating a blanket of foam over the burning cooking media and cooling the surfaces
D. A dry chemical system that discharges sodium bicarbonate powder into the hood and duct to smother grease fires on contact

77. A contractor is reviewing a residential project's structural plans and the engineer specifies a point load at the center of a floor joist span from a post above. The engineer requires the joist to be doubled at this location and specifies a specific connection detail. The contractor installs a single joist at the point load location. What structural consequence does this create?

A. A single joist at the point load location may deflect excessively or fail because it has half the load capacity of the specified doubled joist, creating a concentrated stress point that exceeds the single member's design capacity
B. A single joist is adequate for all residential point loads because residential floor live loads are uniformly distributed and never concentrated
C. The doubled joist requirement is a conservative design approach and a single joist provides adequate capacity for all point loads
D. The point load distributes through the subfloor sheathing to adjacent joists, eliminating the need for the doubled member at the location

78. A contractor is managing a commercial project and the specifications require the contractor to provide a maintenance and operations training program for the building staff before the project is turned over to the owner. The contractor provides the equipment manuals but does not conduct the hands-on training sessions specified in the contract. What is the consequence of this omission?

A. Providing the manuals satisfies the training requirement because the building staff can learn equipment operation from the documentation
B. The training omission has no practical consequence because building maintenance staff are already trained on all equipment types
C. The contractor has no obligation to train the building staff because training is the equipment manufacturer's responsibility exclusively
D. The building staff may not be able to properly operate and maintain the installed systems, leading to premature equipment failure, inefficient operation, and potential safety hazards, and the contractor has not fulfilled the closeout requirements

79. A contractor is building a residential home and the local jurisdiction has adopted the Oregon Residential Specialty Code. The code requires smoke alarms to be hardwired with battery backup and interconnected throughout the dwelling. The contractor installs battery-only smoke alarms that are not interconnected. During the final inspection, the inspector rejects the installation. What must the contractor do?

A. Add wireless interconnection modules to the battery-only alarms as a field modification to achieve the interconnection requirement
B. Replace all battery-only alarms with hardwired smoke alarms that have battery backup and are interconnected so that activation of any single alarm triggers all alarms in the dwelling simultaneously
C. Request a variance from the building department to accept the battery-only alarms because they provide equivalent fire detection capability
D. Install one hardwired alarm in the hallway and connect the remaining battery alarms to it through a wireless bridge adapter

80. Under Oregon law, a contractor completes a residential project and the homeowner files a CCB complaint alleging defective workmanship on the exterior siding installation. The CCB investigates and determines the complaint is valid. The CCB orders the contractor to make repairs. The contractor refuses to comply with the CCB's order. What enforcement action can the CCB take?

A. The CCB may suspend or revoke the contractor's license, assess civil penalties, and authorize payment from the contractor's surety bond to compensate the homeowner for the cost of hiring another contractor to complete the repairs
B. The CCB has no enforcement authority and must refer the matter to circuit court for judicial enforcement of the repair order
C. The CCB may issue a written warning but cannot take any further action against the contractor's license or surety bond
D. The CCB must wait one year before taking any enforcement action to give the contractor additional time to comply voluntarily

Practice Exam 24: Answer Key and Explanations

1. B — Construction on a site with known soil contamination from perchloroethylene requires regulatory clearance from the Oregon Department of Environmental Quality before excavation begins. The DEQ must approve the contaminated soil management plan that specifies how the contaminated material will be handled, tested, transported, and disposed of during construction. Proceeding without DEQ clearance exposes the contractor to environmental violations and significant liability.

2. B — Oregon's implied warranty of workmanlike construction is not waived by the homeowner's full payment or project completion. Tile falling off the wall within eight months due to improper substrate preparation clearly falls below the standard of a reasonably competent contractor. The homeowner may file a CCB complaint, pursue a bond claim, and potentially file a civil lawsuit to recover the cost of repairs.

3. D — Shear tab connections transfer only vertical loads and cannot resist the rotational forces that moment connections are designed to carry during seismic events. The building's lateral force-resisting system depends on moment connections to provide the rigid frame action needed to resist earthquake forces. Installing shear connections instead fundamentally compromises the building's ability to resist lateral loads.

4. C — Oregon's sick leave law generally requires employers to provide sick leave that accrues from the start of employment and can be used for the employee's own illness or to care for a family member. Employees do not need to work for a year before becoming eligible. The law applies to employers of all sizes, though the requirements for paid versus unpaid leave may vary based on employer size.

5. D — Penetrating an artesian aquifer creates a flowing well that must be controlled to prevent groundwater waste, contamination, and property damage. The contractor must stop drilling immediately, secure the flowing water, and notify the Oregon Water Resources Department because artesian wells are regulated. Uncontrolled artesian flow can deplete the aquifer, contaminate surface water, and damage the property.

6. D — In a medical office where patient confidentiality is paramount, HVAC equipment that exceeds the specified STC rating can transmit sound through walls and ceilings into examination rooms. This noise transmission may allow conversations to be overheard between rooms, violating HIPAA privacy requirements. The STC rating ensures the equipment enclosure provides adequate sound isolation for the healthcare environment.

7. B — Standing water in a crawl space indicates a drainage problem that must be resolved before installing a vapor barrier. Simply covering the water with a barrier does not address the source of the water and creates conditions for mold growth and structural deterioration beneath the barrier. The contractor must identify the water source, install drainage, and ensure the space is dry before vapor barrier installation.

8. C — A roof moisture survey uses infrared thermography, nuclear moisture meters, or electrical capacitance instruments to identify areas of trapped moisture within the roof insulation or assembly. Trapped moisture causes insulation degradation, membrane

deterioration, and potential structural damage if left unaddressed. Identifying wet areas before the warranty inspection ensures deficiencies are corrected before the warranty is issued.

9. B — Oregon building codes require separate permits for each regulated trade discipline. A detached structure with electrical service, plumbing, and mechanical systems requires a building permit for the structure, an electrical permit for the wiring, a plumbing permit for the bathroom fixtures and piping, and a mechanical permit for the HVAC system. Each permit triggers separate inspections by qualified inspectors.

10. C — A damaged bus duct presents immediate electrocution and arc flash hazards that require the affected section to be de-energized immediately. The contractor must secure the area to prevent worker contact with the damaged conductors and notify a qualified electrician to assess the damage. Re-energizing the system without proper repair creates life-threatening electrical hazards for all workers in the area.

11. B — When the outdoor air intake is too close to the kitchen exhaust outlet, the exhaust air containing cooking odors, grease particles, and moisture is drawn back into the building through the ERV intake. This short-circuiting defeats the purpose of the ventilation system by reintroducing the contaminated air that was just exhausted. Building codes specify minimum separation distances between exhaust outlets and air intakes.

12. D — Limiting the water-to-cement ratio produces denser, less permeable concrete with fewer capillary voids. This reduced permeability resists the penetration of water, chlorides from deicing salts, and other harmful substances that cause freeze-thaw damage and reinforcement corrosion. Exterior exposed concrete requires this enhanced durability because it faces direct weather exposure throughout its service life.

13. C — Lumber with twenty-five percent moisture content will shrink significantly as it dries to the equilibrium moisture content of the enclosed building, typically eight to twelve percent. This shrinkage causes nail pops through drywall, cracks in drywall joints, squeaking floors from loosened connections, and potential loosening of structural hardware. Using lumber at nineteen percent or less minimizes post-construction shrinkage problems.

14. B — Under most commercial lease agreements, the tenant who agreed to pay for all improvements bears the cost of necessary modifications to existing building systems that are triggered by the tenant's layout changes. The sprinkler modification is a direct consequence of the tenant improvement design and falls within the tenant's contractual obligation. The specific allocation depends on the lease terms.

15. A — Steel conducts heat approximately four hundred times more readily than wood, creating significant thermal bridges through the wall assembly at every stud location. Even with insulation filling the stud cavities, the steel studs bypass the insulation's thermal resistance, reducing the effective R-value of the wall assembly by thirty to fifty percent. Continuous exterior insulation is required to address this thermal bridging.

16. B — A lightning protection system provides a network of air terminals, conductors, and grounding electrodes that create a low-resistance path for lightning current to follow safely to ground. This controlled path prevents lightning from traveling through the building's structure, electrical systems, or mechanical equipment, which could cause fires, explosions, equipment damage, and injury to occupants.

17. D — Cracked and deteriorating clay tile flue liners cannot contain the high-temperature combustion gases and embers within the chimney. Heat and sparks can escape through the cracks and ignite combustible framing materials adjacent to the chimney, causing a concealed structure fire. The contractor must inform the homeowner of the fire hazard and recommend relining with an approved liner system before any fireplace use.

18. C — Concrete hardeners and densifiers chemically react with the calcium hydroxide in the concrete surface to produce calcium silicate hydrate, which is harder and denser than the original surface. This treatment increases surface hardness, reduces dusting from foot and vehicle traffic, and improves abrasion resistance. The result is a more durable floor surface that requires less maintenance over the building's life.

19. C — Without a contractual dispute resolution clause, both parties have access to the full range of dispute resolution options available under Oregon law. These include the CCB complaint process for regulatory resolution, voluntary mediation for facilitated negotiation, arbitration by mutual agreement for a binding private decision, and litigation in court for judicial resolution.

20. B — The room area is one hundred twenty feet times eighty feet equaling nine thousand six hundred square feet. The cost at four dollars and twenty-five cents per square foot equals forty thousand eight hundred dollars. Adding the fifteen percent markup yields forty thousand eight hundred times one-point-one-five, equaling forty-six thousand nine hundred twenty dollars.

21. B — A twelve-inch-wide footing has twenty-five percent less bearing area than the specified sixteen-inch-width footing. This reduced area concentrates the building loads on a smaller soil contact surface, potentially exceeding the soil's bearing capacity. When the soil is overloaded, it compresses unevenly, causing differential settlement that can crack the foundation, walls, and other structural elements.

22. C — The fire department connection must be visible and readily accessible from the street or fire lane so firefighters can quickly locate and connect their hoses during an emergency. Every second of delay in establishing the supplemental water supply reduces the sprinkler system's effectiveness against a growing fire. A concealed FDC forces firefighters to waste critical time searching for the connection.

23. C — The manufacturer's listing and installation instructions specify the minimum clearances from combustible materials based on testing performed during the product's certification process. These clearances vary by manufacturer and model because different stove designs produce different heat output levels and radiation patterns. The installation must also comply with the applicable building code's clearance requirements.

24. B — The sand blinding layer between the vapor barrier and the concrete slab can absorb and retain moisture from the ground, concrete bleed water, and rain during construction. This trapped moisture has nowhere to drain because the vapor barrier below prevents downward movement. The moisture then migrates upward through the slab as it dries, causing flooring adhesion failures, mold growth, and efflorescence.

25. D — A completion certificate does not waive claims for latent defects that were concealed and not discoverable through reasonable inspection at the time of sign-off. Missing foundation

reinforcement is a concealed defect that could not be detected visually after the concrete was poured. Oregon law protects homeowners' rights to pursue claims for latent defects regardless of prior acceptance documents.

26. C — Building occupants near the side exit doors cannot manually activate the fire alarm system if they discover a fire because no pull stations are available at those exits. This delays the alarm notification and building evacuation while someone runs to a main exit to activate a pull station. Manual pull stations at every exit ensure immediate alarm activation regardless of where in the building the fire is discovered.

27. A — A structural ridge beam carries the roof loads and transfers them to supporting posts or bearing walls at each end, eliminating the outward thrust that rafters exert on the wall plates. Without the ridge beam, a conventional ridge board serves only as a nailing surface and cannot support gravity loads. Without ceiling joists or rafter ties to resist the outward thrust, the rafter loads push the walls outward and the ridge sags.

28. A — A cold joint forms when fresh concrete is placed against concrete that has begun initial set, preventing proper bonding between the two placements. The resulting interface creates a plane of weakness that reduces the beam's shear capacity at the joint location and may allow water infiltration. Cold joints in structural members require evaluation by the structural engineer to determine if remediation is needed.

29. B — Converting a garage to living space triggers multiple building code requirements including insulation for the walls, ceiling, and floor, heating and ventilation systems, adequate electrical outlets, egress windows for bedrooms, smoke and carbon monoxide alarms, and removal or relocation of fuel-burning appliance venting. A building permit is required for the change of occupancy.

30. A — Oregon assesses penalties and interest on underpaid estimated quarterly tax payments for each quarter that the required payments were not made. The penalties accrue from the due date of each quarterly payment until the taxes are paid in full. Making timely estimated payments avoids these penalties and helps the contractor manage cash flow for annual tax obligations.

31. A — Excessive vibrator power causes the steel deck to deflect downward between supports, creating low spots where concrete pools deeper than designed. This produces varying slab thicknesses across the floor, with thin spots that may not have adequate structural capacity and thick spots that add unplanned dead load. The composite section properties differ from the engineer's design assumptions.

32. D — Record drawings are the architect's final design documents updated to incorporate the contractor's field markups showing actual installed conditions. As-built drawings are the contractor's marked-up field set documenting where the actual construction deviates from the original design. The distinction matters because record drawings carry the architect's professional stamp while as-builts are contractor-generated field documents.

33. A — The shortfall is calculated as the difference between the required and installed values divided by the required value. Eight R-value units divided by thirty-eight equals approximately twenty-one percent. This means the installed insulation provides only seventy-nine percent of

the specified thermal resistance, which fails to meet the energy code requirement and will result in higher heating and cooling costs.

34. B — A project cash flow analysis shows the timing and amount of anticipated expenditures and income throughout the project duration. This information enables the owner to plan construction loan draws, schedule financing disbursements, and ensure adequate funds are available when progress payments are due. Without this planning tool, the owner may face cash shortfalls that delay payments and disrupt construction.

35. C — Restricted airflow around the outdoor condensing unit reduces the heat transfer efficiency because the unit cannot draw adequate air volume across the condenser coil. This causes the compressor to work harder, increasing energy consumption and operating temperatures that can lead to premature compressor failure. The reduced clearance also prevents service technicians from accessing the unit for maintenance.

36. B — Oregon law requires employers to provide rest periods that cannot be waived or exchanged for additional pay. The foreman's instruction to skip rest periods violates the state's labor law regardless of the offered compensation. Rest periods exist to protect worker health and safety, and the employer is responsible for ensuring compliance even when facing schedule pressure.

37. A — The incomplete stormwater treatment system does not meet the project specifications or the regulatory requirements for water quality treatment. The hydrodynamic separator provides only preliminary treatment for sediment and floatable materials, while the biofiltration system provides the polishing treatment needed to meet discharge quality standards. Omitting the biofiltration component may violate the project's stormwater management permit.

38. D — Disconnecting the fire alarm system in an occupied building creates a life-threatening condition for all building occupants. Instead, the contractor should implement dust control measures to prevent false alarms, install temporary detector covers or replacements approved by the fire marshal for the construction area, and maintain fire watch procedures. The fire alarm system must remain operational in all occupied areas.

39. C — The acceptability of zinc-plated connectors depends on the specific preservative treatment used in the pressure-treated lumber. Modern copper-based preservatives such as ACQ and CA-C are more corrosive to standard zinc plating than the older CCA treatment. The contractor must verify compatibility between the preservative type and the connector coating, potentially requiring hot-dipped galvanized or stainless steel connectors.

40. A — The paint color change from light gray to dark blue requires additional coats to achieve full coverage, representing additional labor and material that was not included in the original contract scope. The contractor is entitled to a change order covering the cost of the additional coats because the supplemental instruction changed the work requirements. Color changes that affect the quantity of work are compensable changes.

41. C — Bathroom exhaust fans may serve as the exhaust component of a whole-house ventilation strategy if they are rated for continuous operation at the required airflow rate specified by the ventilation standard. However, the fans must run continuously or on a programmed duty cycle rather than only during bathroom use, and provisions for makeup air may be needed to balance the exhaust ventilation.

42. D — Headed stud anchors must be welded to the top flange to extend into the concrete slab above, creating the mechanical interlock that develops composite action between the steel beam and the concrete slab. Studs on the bottom flange point downward into the open space below the beam and cannot engage the concrete above. Without composite action, the beam must resist all loads independently, exceeding its non-composite capacity.

43. A — Oregon's worker classification tests examine behavioral control, financial control, and the nature of the relationship to determine whether a worker is an employee or independent contractor. When the contractor provides all tools, controls the schedule and work methods, and pays an hourly rate, these factors strongly indicate an employment relationship. The signed agreement does not override the actual working conditions.

44. D — An undersized grease interceptor cannot provide adequate retention time for the grease to separate from the wastewater flow before the water exits the unit. Grease passes through to the sanitary sewer, accumulating in the sewer lines and causing blockages. This condition violates discharge regulations and can result in sewer backups, fines from the wastewater authority, and costly sewer line cleaning.

45. D — The NEC requires GFCI protection on all receptacle outlets serving kitchen countertop surfaces in residential dwellings. Kitchen countertops are wet environments where water, appliances, and electrical outlets are in close proximity, creating elevated shock hazards. GFCI protection detects current imbalances and disconnects power within milliseconds to prevent electrocution.

46. C — Photoluminescent exit path markings absorb ambient light during normal conditions and glow in the dark when power fails or smoke obscures normal and emergency lighting. These self-luminous markings provide visible wayfinding guidance on stair treads, handrails, and door frames that helps building occupants navigate stairways safely during evacuation when visibility is severely reduced.

47. A — Unrestrained suspended equipment can swing, break free from its hangers, and fall during a seismic event, creating a serious falling object hazard for building occupants. The swinging equipment can also rupture connected piping, releasing water, refrigerant, or other fluids. Seismic restraints limit equipment movement during earthquakes and prevent separation from the building structure.

48. B — Pouring the full eight-foot wall height in a single lift creates excessive lateral pressure on the ICF forms that exceeds their design capacity. The resulting form bulging or blowout causes concrete spills, wall misalignment, and potentially dangerous form failure that could injure workers. The manufacturer's lift height limitation ensures the forms can safely contain the concrete pressure during placement.

49. A — The sole proprietor's personal exemption from workers' compensation coverage applies only to the sole proprietor and does not extend to any hired employees. The moment the contractor hires the part-time laborer, Oregon law requires the contractor to obtain workers' compensation insurance for that employee. Failure to provide coverage exposes the contractor to statutory employer liability.

50. B — Economizer controls are designed to open the outdoor air dampers when outdoor temperatures and humidity are favorable, allowing free cooling from outdoor air instead of

running the mechanical refrigeration system. When the dampers remain closed, the building uses mechanical cooling even when free cooling is available, wasting the energy savings the economizer is designed to provide.

51. A — A three-eighths-inch anchor bolt has approximately forty-four percent less cross-sectional area than a half-inch bolt, significantly reducing its tensile and shear capacity. The structural engineer specified half-inch bolts based on calculated wind uplift and seismic forces that require the full capacity of the larger bolt. The undersized bolt may fail before reaching the design loads, compromising the sill plate connection.

52. C — A dry pipe sprinkler system keeps the piping filled with pressurized air or nitrogen rather than water. When a sprinkler head activates from fire heat, it releases the air pressure, which opens the dry pipe valve and allows water to fill the piping and discharge through the activated head. This prevents water from freezing in the piping in unheated spaces where a wet pipe system would be vulnerable.

53. D — Federal Pacific Stab-Lok panels have a well-documented history of circuit breakers failing to trip during overcurrent conditions. When a breaker fails to trip, the excessive current continues flowing through the circuit, overheating the wiring and creating a fire hazard. The contractor should advise the homeowner of this known safety issue and recommend evaluation by a licensed electrician with potential panel replacement.

54. C — A variable frequency drive adjusts the fan motor speed to match the actual airflow demand in the building at any given time. During partial-load conditions, which represent the majority of operating hours, the VFD reduces motor speed rather than running at full speed and throttling with dampers. Fan power is proportional to the cube of the speed, so even small speed reductions produce significant energy savings.

55. A — Oregon law implies a warranty of workmanlike construction on residential projects regardless of whether the contract includes express warranty language. This means the contractor's work must meet the standard of a reasonably competent contractor performing similar work. The implied warranty exists by operation of law and provides the homeowner with a minimum level of quality assurance.

56. D — Stressing post-tensioning tendons before the concrete reaches the specified minimum compressive strength can cause the concrete to crack, crush, or spall at the anchorage zones where the tendon forces are concentrated. The concrete must be strong enough to resist the high compressive forces applied by the stressed tendons. Field-cured cylinder tests verify the concrete has achieved adequate strength before stressing begins.

57. D — An area of refuge is a fire-rated space with direct access to an exit stairway where occupants who cannot use stairs, such as individuals with mobility impairments, can wait safely for emergency personnel to assist with evacuation. The space must be protected from fire and smoke and must include a two-way communication system to contact emergency responders. This provision ensures equitable evacuation for all occupants.

58. C — The seven ACH50 result is more than double the three ACH50 code requirement, indicating significant air leakage throughout the building envelope. The contractor must identify the major leakage paths using diagnostic tools such as a smoke pencil or theatrical fog

in combination with the blower door, seal the identified pathways, and retest until the building achieves the three ACH50 maximum.

59. A — Charging personal expenses to the project account under a cost-plus contract constitutes fraud because it misrepresents the actual project costs to the homeowner. The contractor has a fiduciary obligation under the cost-plus arrangement to charge only legitimate project costs. Personal purchases disguised as project expenses violate this trust and expose the contractor to criminal and civil liability.

60. D — Twenty-eight-day cylinder tests showing thirty-two hundred psi against a specification of four thousand psi represent a significant strength deficiency of twenty percent. The contractor must notify the structural engineer, who will evaluate whether the in-place concrete is adequate for the actual loads or whether corrective measures are needed. Options include core testing, load testing, structural analysis at the reduced strength, or removal and replacement.

61. D — A twenty-four-foot clear span typically exceeds the practical capacity of built-up dimensional lumber headers, which is why the structural engineer specified a steel beam. Steel beams can span much greater distances with less depth and deflection than wood members. Substituting a lumber header at this span would likely result in excessive deflection, structural overstress, or failure under the roof and wall loads above.

62. B — Nonlinear electrical loads generate harmonic currents that distort the power supply waveform. These harmonics cause overheating of transformers, neutral conductors, and other electrical equipment, reduce power quality, and can cause premature equipment failure. The harmonic filter reduces the distortion to acceptable levels, protecting the electrical infrastructure and connected equipment.

63. D — Adding radiators to an existing hydronic system without rebalancing creates an imbalance where water follows the path of least resistance through the shorter, existing piping loops rather than the longer new piping serving the addition. The result is insufficient hot water flow to the new radiators while the existing rooms may overheat from excessive flow. Balancing valves must be adjusted to equalize flow throughout the system.

64. A — The contractor may face liability for construction defects under Oregon's implied warranty of workmanlike construction, which applies to speculative home builders. Additionally, the real estate agent's representation about the roof condition may constitute misrepresentation for which the contractor-developer bears responsibility. Oregon's property disclosure requirements mandate disclosure of known material defects.

65. C — Low-voltage network cabling for building automation systems may be installed by qualified technicians or contractors who hold the appropriate limited energy license or exemption under Oregon's electrical regulations. The specific licensing requirements depend on the type of cabling, voltage level, and the regulatory framework established by the Oregon Electrical Board. Not all low-voltage work requires a full electrician's license.

66. D — Air-entrained concrete contains billions of microscopic air bubbles distributed throughout the cement paste. When water within the concrete freezes, it expands into these air voids rather than creating pressure that damages the concrete matrix. Without air entrainment,

the expanding ice has nowhere to go and the resulting pressure causes the concrete surface to scale, flake, and spall.

67. D — A gas-fired generator installed inside a garage requires adequate combustion air supply to support the engine's fuel combustion, proper exhaust venting to the exterior to remove combustion gases including carbon monoxide, and compliance with clearance requirements from combustible materials. The installation must also maintain the fire separation between the garage and any adjacent living space.

68. B — Purlin misalignment affects the metal roof panel attachment because the panels are designed to be fastened to purlins at specific intervals. When the purlins are out of position, the panel fastener locations may not align with the structural support points, potentially reducing the roof's capacity to resist wind uplift and snow loads. The structural engineer must evaluate and approve any modification.

69. C — Exposed rigid foam insulation can ignite when exposed to fire and produces toxic smoke containing hydrogen cyanide and other dangerous gases. The fire code requires a thermal barrier such as gypsum board to protect the foam from direct flame contact, slowing its involvement in a fire and reducing the production of toxic smoke. This requirement applies to crawl spaces where foam insulation is exposed.

70. A — The responsible managing individual is the designated person on the CCB license who is responsible for the contractor's construction activities and compliance with Oregon's contractor licensing laws. The RMI must meet the CCB's qualification requirements, which may include experience, examination, and personal accountability for the company's operations and regulatory compliance.

71. D — When the energy model projects the building will exceed the target energy use intensity, the contractor should work with the mechanical engineer and commissioning agent to identify and implement energy conservation measures. These may include equipment upgrades, control sequence optimization, envelope improvements, or operational changes that bring the projected energy use within the specified target.

72. B — Twenty-five-hundred-psi concrete has lower surface hardness and abrasion resistance than the specified three-thousand-psi mix. Vehicle tires grinding against the softer surface wear away the paste layer more quickly, exposing aggregate and creating dust. The three-thousand-psi specification was selected specifically to provide adequate durability for the garage floor's intended use under vehicle traffic.

73. B — Standard tempered glass, while strong under impact, shatters completely and falls out of the frame when exposed to fire temperatures. This creates an unprotected opening in the fire-rated wall assembly that allows fire and smoke to pass through freely. Fire-rated glazing is specifically manufactured and tested to remain intact and maintain its fire resistance for the rated duration.

74. A — A continuous air barrier controls unintended air movement through the building envelope, which is the primary mechanism for both energy loss from infiltration and moisture damage from warm humid air condensing inside cold wall cavities. By sealing the envelope against air leakage, the air barrier reduces heating and cooling energy consumption, prevents moisture-related damage, and improves indoor air quality.

75. D — Many outdoor gas-fired pool heaters are designed and listed for outdoor installation without a traditional chimney or vent system because the combustion gases exhaust directly to the open atmosphere where they disperse naturally. However, the installation must comply with clearance requirements from building openings, property lines, and combustible materials to prevent exhaust gas accumulation.

76. C — Commercial kitchen hood fire suppression systems typically use wet chemical agents containing potassium-based compounds that are specifically formulated for suppressing grease fires. The agent creates a foam blanket over the burning cooking media that smothers the flames and cools the hot surfaces below the auto-ignition temperature. This prevents reignition after the agent discharge is complete.

77. B — A single joist at a point load location has half the capacity of the specified doubled joist, creating a concentrated stress point that may cause excessive deflection, joist cracking, or complete failure under the applied load. The structural engineer specified the doubled joist because the single member's capacity is insufficient for the concentrated post load from the structure above.

78. D — Without hands-on training, building maintenance staff may not understand how to properly operate, adjust, and maintain the installed systems. Improper operation leads to premature equipment failure, wasted energy, uncomfortable building conditions, and potential safety hazards. The training requirement is a contractual closeout obligation that ensures effective knowledge transfer from the installing contractor.

79. B — The Oregon Residential Specialty Code requires smoke alarms to be hardwired with battery backup and interconnected so activation of any alarm triggers all alarms simultaneously throughout the dwelling. Battery-only alarms do not meet this requirement because they lack the permanent power connection and reliable interconnection that hardwired systems provide. The contractor must install code-compliant alarms.

80. A — The CCB has enforcement authority to suspend or revoke a contractor's license for failing to comply with a CCB order, assess civil penalties, and authorize payment from the contractor's surety bond to compensate the homeowner. These enforcement tools ensure that contractors comply with CCB orders and that homeowners receive the financial remedy they are owed when contractors refuse to make required repairs.