BICSI Data Center Design Consultant - DCDC

BICSI DCDC-003.1

Version Demo

Total Demo Questions: 14

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Topic Break Down

Topic	No. of Questions
Topic 1, Data Center Design Process	1
Topic 2, Site Selection	8
Topic 3, Architectural Design	30
Topic 4, Electrical Design	38
Topic 5, Mechanical Design	31
Topic 6, Telecommunications Infrastructure	22
Topic 7, Security	8
Topic 8, Operations and Maintenance	4
Topic 9, Mix Questions	1
Total	143

QUESTION NO: 1

What is the minimum separation distance of underground telecommunications and utility cabling in same route?

A. 2 feet minimum along entire route

B. 6 feet minimum along entire route

C. no need for separation as long as they are enclosed in different conduit systems.

D. none of the above

ANSWER: B

Explanation:

6 feet minimum along entire route is the appropriate minimum separation criterion for underground telecommunications cabling and utility cabling that must follow the same general route in a data center environment. Maintaining this separation reduces exposure to electrical interference, accidental physical damage during excavation or maintenance, and common-route failures that could affect critical communications services. It also supports the resilient, maintainable infrastructure objectives expected in data center design, where pathways should be planned to preserve service continuity and to allow safe access to each utility system.

The distance should be treated as a continuous routing requirement rather than something applied only at selected points. During site and pathway design, the designer should document utility corridors, coordinate with the electrical and civil disciplines, account for local authority requirements, and retain the required clearance through changes in direction, handholes, vaults, and building-entry areas. BICSI guidance emphasizes coordinated pathway design, physical protection, and separation from sources that can compromise telecommunications infrastructure. Applicable local codes and utility-owner requirements can impose additional constraints and should be incorporated where they are more stringent. See BICSI's standards resources at https://www.bicsi.org/standards and the Telecommunications Industry Association standards information at https://tiaonline.org/standards/.

QUESTION NO: 2

What is the recommended range of temperature for a data center?

A. 18-22°C (64-72°F)

B. 20-24°C (68-75°F)

C. 22-26°C (72-79°F)

D. 24-28°C (75-82°F)

E. 26-30°C (79-86°F)

F. 18-27°C (64-81°F)

ANSWER: F

Explanation:

The recommended temperature range is **18–27°C (64–81°F)**, measured at the air inlet to IT equipment. This range aligns with the ASHRAE Thermal Guidelines recommended envelope commonly used in data-center design and operations. Designing around equipment-inlet conditions is important because a room-level thermostat reading can differ materially from the temperature delivered to servers, storage, and network devices, particularly in high-density racks or where airflow containment is used.

Maintaining this recommended inlet range supports reliable equipment operation while allowing efficient cooling-system design. It gives designers and operators sufficient thermal margin to account for load variation, airflow distribution, return-air mixing, and temporary cooling events without unnecessarily restricting opportunities for energy-efficient cooling. The range should be implemented with appropriate environmental monitoring at representative rack inlets, together with controls that account for the installed IT equipment's manufacturer requirements. ASHRAE distinguishes this recommended operating envelope from broader allowable equipment classes; the recommended range is the normal target for dependable, efficient operation rather than simply the widest temperature an individual device may tolerate. See the ASHRAE Technical Committee 9.9 resources and ASHRAE's Thermal Guidelines for Data Processing Environments.

QUESTION NO: 3

What is the low temperature that must be maintained in a data center according to NEB standards?

A. 55 degrees

B. 60 degrees

C. 65 degrees

D. 70 degrees

E. 75 degrees

ANSWER: C

Explanation:

65 degrees is the expected lower temperature value in this question, expressed as 65°F (approximately 18°C). In the context of data-center and telecommunications-facility design, maintaining a defined minimum ambient temperature supports reliable operation of installed equipment and helps avoid environmental conditions that can affect equipment performance or create condensation-related risks when cooling conditions change. This value should be understood as a facility design and operating requirement associated with the referenced NEB/NEBS-oriented guidance, rather than as a universal equipment inlet-temperature limit for every IT device. The actual permitted temperature range for a particular installation must also account for the manufacturer's environmental specifications, the equipment location, airflow arrangement, humidity control, and the governing project standard. BICSI design practice emphasizes coordinating the data-center environmental design with applicable standards and with the installed equipment's requirements. ASHRAE's data-center thermal guidance similarly provides equipment classes and recommended operating envelopes that designers use alongside applicable telecommunications requirements. See BICSI's standards resources at https://www.bicsi.org/standards and ASHRAE's Technical Committee 9.9 resources at https://tc0909.ashraetcs.org/.

QUESTION NO: 4

What is the distance from the bottom of the access floor to the bottom of the cable tray?

A. 6 inches

B. 7 inches

C. 8 inches

D. 9 inches

E. 10 inches

ANSWER: C

Explanation:

The required distance is **8 inches**. In a raised-floor data-center environment, this clearance establishes a defined overhead space below the access-floor panels for the underfloor cable-tray pathway. Maintaining the specified separation helps ensure that the tray can be installed, supported, inspected, and serviced without interfering with the access-floor system. It also preserves a deliberate physical arrangement for telecommunications cabling rather than allowing cabling to rest directly on the structural floor or become entangled with other underfloor infrastructure. This dimension is part of the coordinated raised-floor pathway design addressed in BICSI data-center guidance, where cable pathways, access flooring, power distribution, grounding, cooling, and maintenance access must be considered as an integrated system. The 8-inch value is therefore a design clearance criterion, not simply an arbitrary installation preference. For broader BICSI data-center design guidance, see the BICSI available standards page and BICSI's Data Center Design Consultant certification information.

QUESTION NO: 5

Where is the recommended location for remote power panels?

A. at one or both ends of an equipment row

B. outside the building

C. inside a sealed room

D. suspended from ceiling

ANSWER: A

Explanation:

Remote power panels are recommended at one or both ends of an equipment row because this arrangement places branch-circuit distribution close to the cabinets served while preserving a practical, organized distribution path along the row. An RPP receives upstream power and distributes multiple monitored branch circuits to rack-level power equipment. Locating it at the row end supports efficient cable routing, simplifies identification of circuits associated with that row, and allows access for panel operation and maintenance without placing the panel in the primary working area in front of IT equipment. The arrangement also supports scalable deployment: capacity can be assigned to a row or extended by providing distribution at both ends where equipment density, redundancy design, or row length warrants it. Physical placement must still maintain required electrical working clearances, comply with the authority having jurisdiction, and be coordinated with the data center's power-path and containment design. BICSI's data-center design guidance treats power distribution as an integrated facility and white-space design consideration; see the BICSI 002 Data Center Design and Implementation Best Practices. Additional RPP application information is available from Schneider Electric Remote Power Panels.

QUESTION NO: 6

Where is temperature typically measured in a data center HVAC system?

A. At the CRAC unit exhaust

B. At the CRAC unit inlet

C. At the server rack inlet

D. At the server rack exhaust

ANSWER: B

Explanation:

At the CRAC unit inlet is correct because the inlet is the return-air side of a conventional computer room air conditioner (CRAC). A temperature sensor at this point measures the air returning from the data hall after it has absorbed heat from IT equipment. The CRAC control system uses this return-air temperature as a representative load condition and compares it with its configured temperature set point to determine the required cooling response, such as compressor, chilled-water valve, fan, or economizer operation. This measurement location supports stable unit-level control because it reflects the aggregate heat load presented to the cooling unit rather than a single localized condition. In data-center design, room return temperature and supply-air temperature are both important HVAC operating values, while IT-equipment inlet temperatures are separately important for confirming that servers receive air within the recommended environmental envelope. The conventional HVAC control measurement referenced by the question, however, is the CRAC return-air measurement at the unit inlet. ASHRAE describes data-center thermal management and the importance of controlling environmental conditions in its Thermal Guidelines for Data Processing Environments. Vertiv also describes CRAC systems as precision cooling equipment for computer rooms in its CRAC glossary entry.

QUESTION NO: 7

what is the minimum thickness of an elevated floor topping over metal flutes?

A. 2 inchmhesB, 3 Inches

B. 4 Inches

C. 1.5 inches

ANSWER: C

Explanation:

The minimum elevated-floor topping thickness over the crowns of metal flutes is 1.5 inches (38 mm). This dimension identifies the minimum concrete cover above the top of the corrugated metal deck, rather than the total depth of the slab measured to the bottom of the flutes. Maintaining this topping thickness provides the continuous concrete layer needed to distribute imposed floor loads across the deck profile and to create a suitable, stable substrate for the data-center floor assembly. In data-center design, the structural-floor system must be coordinated with equipment loading, rack layouts, seismic requirements, penetrations, and any raised-access-floor system. The 1.5-inch criterion is therefore a baseline construction requirement; the final slab/deck assembly must still be engineered for the project's actual dead loads, live loads, concentrated equipment loads, and applicable building-code requirements. BICSI's DCDC credential addresses the coordinated design of these data-center infrastructure systems; see BICSI Data Center Design Consultant (DCDC). Additional technical information on steel floor-deck systems and their structural application is available from the Steel Deck Institute.

QUESTION NO: 8 - (SIMULATION)

What are the equipment clearance/access requirements when designing the door openings and loading dock areas for a data center?

ANSWER: See the explanation for the answer

Explanation:

Answer: Size door openings, loading docks, and the entire receiving route for the **largest and heaviest item that will be delivered, removed, or replaced** during the data center life cycle—not merely for normal personnel access or the initially installed racks.

Use the **actual clear opening** (clear width and clear height with the door open), including the dimensions of the equipment's shipping crate, pallet/skid, required rigging, and handling device.
Provide enough additional clearance for safe movement and maneuvering; consider door hardware, bollards, ramps, turning radii, corridors, elevators, overhead obstructions, and changes in floor level.
Verify that the complete path from the truck/loading dock to the final equipment location supports the required **floor loading, point loading, and rolling loads**.
The loading dock must accommodate the expected delivery vehicles and permit safe unloading, staging, and movement of large equipment such as generators, UPS modules, switchgear, cooling equipment, and IT cabinets.
Provide a suitably sized dock door, dock leveler/ramp or grade-level access as applicable, adequate overhead clearance, truck approach/turning space, weather protection where needed, and a secure staging/receiving area.
Coordinate access with security requirements: delivery access should be controllable without creating an uncontrolled route into critical white space.

In short, perform an equipment-access-route survey early in design and ensure that **every opening and segment of the route is larger and stronger than the largest anticipated equipment shipment and its handling method.** Fixed minimum door or dock dimensions alone are not sufficient when larger future equipment is anticipated.

QUESTION NO: 9

A facility requires concurrent maintenance of a UPS module without interruption to the critical IT load. The proposed system has N+1 UPS capacity, but all UPS output modules feed one nonmaintainable common output bus. Which design change most directly addresses the remaining availability concern?

A. Increase the battery runtime for each UPS module.

B. Add maintainable isolation and bypass paths for the UPS distribution system.

C. Increase the generator fuel storage capacity.

D. Install larger power distribution units in the computer room.

ANSWER: B

Explanation:

The design needs a maintainable distribution and isolation arrangement in addition to redundant UPS capacity. N+1 capacity can tolerate the loss of one capacity component, but it does not by itself remove a common distribution element that may require shutdown or could fail.

Providing properly coordinated isolation and bypass paths allows work on a UPS module or related distribution equipment while preserving power to the critical load. Increasing battery runtime or generator fuel storage improves outage endurance, but neither resolves the common output-bus maintenance exposure.

QUESTION NO: 10

What is the ASHRAE TC 9.9 recommended range for static pressure in a data center?

A. 0.01-0.05 inches water gauge

B. 0.05-0.1 inches water gauge

C. 0.1-0.15 inches water gauge

D. 0.15-0.2 inches water gauge

ANSWER: A

Explanation:

0.01-0.05 inches water gauge is the ASHRAE TC 9.9 recommended static-pressure range for a data center. This range refers to maintaining the data-center space at a slight positive pressure relative to adjacent spaces. Positive pressurization helps limit uncontrolled infiltration of unconditioned air, airborne particulates, and contaminants through openings in the room envelope. It also supports a more controlled environmental condition for information-technology equipment and helps the cooling design perform predictably.

The target is intentionally small: it is sufficient to establish a directional tendency for air to move outward from the protected data-center space without creating excessive forces at doors or unnecessarily increasing fan energy. Achieving the range requires attention to the room envelope, supply and return/exhaust airflow balance, leakage paths, and pressure monitoring. The value should be verified under representative operating conditions, including normal door-closed operation, because large or frequent openings can temporarily affect measured pressure.

ASHRAE's data-center environmental guidance is published through TC 9.9 and the Datacom Series, including the ASHRAE Datacom Series. The committee's scope and technical-resource information are available from ASHRAE TC 9.9.

QUESTION NO: 11

What are three primary considerations in designing the power systems space plan?

A. Energy utilization, efficiency of cooling and redundant generators

B. Physical security, environmental monitoring, backup power source

C. Reduce transmission loss, minimize conduit paths, and meet system spacing requirements

D. Leakage current control, firewall protection & hardening redundancy

ANSWER: C

Explanation:

Reduce transmission loss, conduit-path minimization, and system spacing requirements are primary power-system space-planning considerations because the physical arrangement of electrical infrastructure directly affects both performance and maintainability. Locating transformers, switchgear, distribution equipment, and downstream loads to limit conductor runs helps reduce impedance, voltage drop, and resistive losses. The U.S. Department of Energy notes that electrical distribution efficiency is affected by conductor and distribution-system losses, making efficient routing an important design objective. Conduit routes also need to be planned early so that pathways are direct, accessible, coordinated with structural and mechanical systems, and capable of accommodating installation and future changes. Finally, spacing must provide the working clearances, dedicated equipment space, access, ventilation, and safety separation required for electrical equipment. These clearances support safe operation, inspection, servicing, and emergency response throughout the facility lifecycle. Occupational Safety and Health Administration requirements identify adequate working space around electrical equipment as a core safety condition. Together, efficient power paths, practical conduit routing, and compliant equipment spacing form the essential spatial basis for a reliable and serviceable data-center power system. See U.S. Department of Energy grid modernization resources and OSHA electrical equipment space requirements.

QUESTION NO: 12

what room should the battery room be adjacent to?

A. the electrical Room

B. computing Room

C. Mechanical Room

D. Security Rooms

E. Non-combustible materials

F. all

ANSWER: A

Explanation:

The electrical Room is the appropriate adjacent space because stationary batteries are normally installed as part of the uninterruptible power system and its associated power-distribution infrastructure. Locating the battery room directly beside the electrical/UPS equipment room keeps the DC battery conductors short, direct, and readily maintainable. This arrangement supports reliable delivery of DC energy to the UPS during a utility outage while reducing conductor voltage drop, limiting installation complexity, and making the electrical power path easier to inspect, isolate, and service. The adjacency also helps designers coordinate dedicated battery ventilation, temperature control, fire/life-safety provisions, spill or electrolyte considerations where applicable, and controlled access with the electrical-system design. The room must still be designed as a separate, appropriately protected battery installation in accordance with the battery technology, capacity, applicable electrical code, fire code, manufacturer instructions, and authority-having-jurisdiction requirements. NFPA's stationary energy-storage guidance addresses installation safety considerations for battery systems, while the U.S. Department of Energy summarizes key safety considerations for energy-storage systems. See NFPA 855 and U.S. Department of Energy: Energy Storage Safety.

QUESTION NO: 13

What should be done with unused rack space?

A. it should be filled with blanking devices to reduce non-functional airflow

B. it should be used for additional storage purposes

C. it should be left open to allow for better ventilation

D. they should be turned off to save energy costs

ANSWER: A

Explanation:

Unused rack space should be filled with blanking devices to reduce non-functional airflow. In a data center using hot-aisle/cold-aisle containment or a similar airflow-management design, open rack units create bypass paths between the cold supply air and the hot exhaust air. This allows conditioned air to circumvent installed IT equipment rather than passing through it, reducing the effectiveness and predictability of the cooling system. Blanking panels close these openings and help preserve the intended front-to-rear airflow path through active equipment. As a result, inlet temperatures are more uniform, hot-air recirculation is reduced, and cooling capacity is used more effectively. Blanking devices should be installed in all unoccupied rack units, including temporary gaps created when equipment is removed, and should be compatible with the cabinet and containment arrangement. This practice is a fundamental part of rack-level airflow management and supports efficient operation while maintaining environmental conditions suitable for IT equipment. The U.S. Department of Energy identifies blanking panels as an airflow-management measure that prevents hot and cold air mixing, and ASHRAE provides data-center thermal guidance supporting effective air-distribution and containment practices. See the U.S. Department of Energy airflow-management guidance and ASHRAE Thermal Guidelines for Data Processing Environments.

QUESTION NO: 14

What room should have its own dedicated air handling system apart from the computer room?

A. Electrical Room

B. Break Room

C. Printer Room

D. Storage Room

E. Telecommunications Room

ANSWER: C

Explanation:

Printer Room is correct because printing equipment creates an environmental load that should be isolated from the computer room's tightly controlled air environment. High-volume printers can release paper dust and fine particulates, generate heat, and produce emissions associated with printing processes. A dedicated air-handling system allows the printer room's temperature, filtration, outdoor-air provision, and any required exhaust to be designed for those conditions without introducing contaminants or uncontrolled heat into the data-processing space. This separation supports the computer room's objective of maintaining clean, stable air for IT equipment and helps avoid transferring printer-related contaminants through a shared return-air path. The approach is consistent with the data-center practice of segregating support functions whose thermal or contaminant characteristics differ materially from the white-space environment. The U.S. Environmental Protection Agency notes that office equipment, including printers, can affect indoor-air quality and should be considered in ventilation and source-control planning. BICSI's data-center design guidance likewise emphasizes coordinated environmental design for computer spaces and their supporting areas. See the EPA indoor air quality guide and BICSI Data Center Design Guide.