Vendor: Cisco

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Exam Name: Designing Cisco Wireless Networks (WLSD)

Version: DEMO

QUESTION 1
A customer is building a new warehouse facility that has only its foundation and perimeter walls built. The building will be complete in the next eight months. The customer needs a detailed bill of materials and costs for a wireless network that must support RF scanners throughout the warehouse.
How should the survey be performed?

A. Perform a passive survey by simulating the wireless propagation using modeled attenuation areas on a digital floor plan.
B. Perform a predictive survey of the existing building and simulate the future attenuation objects using a passive survey.
C. Perform a passive survey of the existing building and simulate the future attenuation objects using a predictive survey.
D. Perform a predictive survey by simulating the wireless propagation using modeled attenuation areas on a digital floor plan.

Answer: D
Explanation:
A predictive survey (also called a virtual or model-based survey) is the appropriate and only feasible methodology for a facility that does not yet physically exist in its complete form. Since the warehouse has only its foundation and perimeter walls, it is impossible to conduct any form of physical (active or passive) survey of the complete environment. A predictive survey uses architectural floor plans imported into a tool such as Ekahau Site Survey, where the engineer defines attenuation areas representing planned materials and structures: concrete block walls, steel shelving racks, metallic surfaces, and other warehouse-specific obstructions. The software models RF propagation through these defined attenuation values, enabling accurate AP placement planning, antenna selection, and channel planning without physical access to the complete facility. The output is a validated bill of materials with AP counts, models, and associated infrastructure requirements.

QUESTION 2
A consulting engineer is preparing to survey a brownfield deployment for a 6000-sqft building with four floors that have APs. The entire building is being remodeled and the furniture, office walls, and decoration are being updated. The engineer must perform a survey analysis on the potential RF impact of newer furniture materials. How must the survey be conducted?

A. Perform a sweep analysis first to predict the signal strength across each point in a floor.
B. Evaluate the neighbor APs strength and density based on the radio statistics information of each AP.
C. Measure upstream and downstream data rates based on the remodeling of the building.
D. Use a survey tool with the existing AP positions using building floor maps and material configuration.

Answer: D
Explanation:
A brownfield deployment scenario involves an existing operational wireless network where a physical remodel will change the RF environment. The engineer's task is to assess the impact of new furniture and wall materials on the existing AP placement -- a scenario requiring a predictive re- analysis of how changed materials will alter propagation from the existing AP locations. Using a survey tool such as Ekahau with the known AP positions superimposed on updated floor plans, the engineer can reconfigure material attenuation properties to reflect new construction materials and re-run the predictive propagation model. This produces a before/after comparison identifying coverage gaps or interference hotspots introduced by the remodel without requiring physical downtime or temporary infrastructure changes.

QUESTION 3
An educational organization recently deployed an anchored WLAN and has a high number of client connections at any given time that stream video. The wireless infrastructure includes two Cisco 9800 WLCs. To prevent web traffic being slow, an engineer must configure the deployment to prevent excessive fragmentation of the client data. Which configuration must the engineer apply?

A. Set the MTU on both controllers to match.
B. Increase the MTU on both controllers.
C. Adjust the TCP MSS value below the fragmentation point.
D. Set the do not fragment bit on the mobility tunnel.

Answer: C
Explanation:
In an anchored WLAN deployment, client traffic is encapsulated within CAPWAP mobility tunnels between the foreign WLC (where the AP joins) and the anchor WLC (in the DMZ or designated network segment). This tunneling adds encapsulation overhead -- CAPWAP/mobility tunnel headers consume a portion of the available MTU on the transport path. When video streaming clients generate large TCP segments, these segments may exceed the effective MTU of the mobility tunnel path, causing IP fragmentation at the WLC or along the path to the anchor. Fragmentation significantly degrades throughput and increases CPU overhead for high-volume video traffic. The correct solution is TCP MSS Clamping -- reducing the Maximum Segment Size value advertised in TCP SYN packets so that TCP endpoints negotiate a segment size remaining below the fragmentation threshold. The Cisco 9800 WLC supports TCP MSS adjustment, which intercepts TCP handshake packets and rewrites the MSS option to a value accounting for CAPWAP tunnel overhead.

QUESTION 4
A retail customer opened two new branch locations, and the main store HQ handles data center operations. Each branch location has three Cisco Catalyst 9130 APs. The data center has a Catalyst 9800 WLC with 18 Catalyst 9130 APs. Growing business and poor WAN uplinks cause impacted branch AP and wireless client connectivity back to HQ, and each branch location is now planned to have its own EWC controller based on C9130 AP to keep traffic local. This new design must accommodate: guests and employees sharing the same WLAN with different VLANs, guest uplink and downlink traffic restricted to 2 Mbps, and each branch acting as secondary or tertiary backup to another branch with the data center WLC always being the primary. Which design approach should the consulting engineer take?

A. Two C9130 branch APs must be converted to EWC mode, one for the active controller and the other for standby, with HQ WLC set as a primary N+1 backup, and other branches' EWC must be added as mobility peers. The branch WLAN will use the guest anchor to HQ WLC for guest VLAN access.
B. One C9130 branch AP must be converted to EWC mode, and the preferred controller is set to that AP with HQ WLC set as a primary N+1 backup and other branches' EWC AP as secondary and tertiary. HQ AAA must be added to EWC, and WLAN with MAB + AAA override must be configured.
C. Two C9130 branch APs must be converted to EWC mode, one for the active controller and the other for standby, with the standby EWC set as N+1 backup. HQ AAA must be added to EWC, and WLAN with dot1x + AAA override must be configured.
D. One C9130 branch AP must be converted to EWC mode, and the preferred controller is set to that AP with HQ WLC set as N+1 backup. The branch guest WLAN will use local web auth on guest VLAN.

Answer: B
Explanation:
This multi-constraint design scenario requires precise alignment of EWC architecture, N+1 redundancy hierarchy, AAA integration, and WLAN security policies. Option B correctly addresses all requirements. With only three APs per branch and a requirement to keep traffic local, converting a single C9130 to EWC mode is the correct and resource-efficient approach -- converting two APs to EWC (Options A and C) wastes AP capacity in a small three-AP branch. The preferred controller set to the EWC AP ensures local APs join locally. The HQ WLC as primary N+1 backup satisfies the data center WLC always being primary requirement. Other branches' EWC APs configured as secondary and tertiary controllers creates the cross-branch redundancy hierarchy. Since guests and employees share the same SSID but require different VLANs, MAC Authentication Bypass (MAB) with AAA override allows the HQ ISE/AAA server to return VLAN attributes based on device or user identity -- dynamically assigning the correct VLAN at the policy level. The 2 Mbps guest rate limiting is applied through per-client QoS policies on the EWC. Option D's use of local web auth for guests does not enable dynamic VLAN assignment from AAA.

QUESTION 5
A university has three campus locations and the main data center. Each campus location has a Cisco Catalyst 9800-40 WLC that manages 600 APs. The data center has a Catalyst 9800-40 WLC, which serves as N+1 backup for each campus WLC. A consulting engineer must install four additional Catalyst 9800-40 WLCs to serve as high availability SSO pairs for each campus, but only two have been approved due to budget restrictions. Requirements: Data center WLC must always be available as N+1 backup, Campus1 WLC must operate with zero downtime, and in the event of multiple campus outages, the AP priority order is to support Campus3, Campus2, then Campus1. Which design approach must the consulting engineer take?

A. The data center WLC and Campus3 WLC are the high availability SSO pair. Campus1 APs have priority 4, Campus2 APs have priority 2, and Campus3 APs have priority 1.
B. The data center WLC and Campus1 WLC are the high availability SSO pair. Campus1 APs have priority 4, Campus2 APs have priority 2, and Campus3 APs have priority 1.
C. The data center WLC and Campus1 WLC are the high availability SSO pair. Campus3 APs have priority 4, Campus2 APs have priority 2, and Campus1 APs have priority 1.
D. The data center WLC and Campus3 WLC are the high availability SSO pair. Campus3 APs have priority 4, Campus2 APs have priority 2, and Campus1 APs have priority 1.

Answer: C
Explanation:
This design scenario requires careful interpretation of the SSO pair function and AP priority semantics. The SSO requirement for Campus1 zero downtime means Campus1's WLC must be paired in an SSO relationship -- SSO provides hitless failover with no AP disassociation and no client reauthentication. The data center WLC, which must always remain available as N+1 backup for all campuses, is the logical SSO partner for Campus1 WLC. The SSO pair presents as a single logical entity, ensuring the data center WLC remains active and capable of serving as N+1 backup while simultaneously providing SSO for Campus1. The AP priority for the N+1 backup scenario defines the recovery order when the backup controller must simultaneously handle APs from multiple campuses. In Cisco WLC AP failover priority, priority 1 is Critical (highest). The stated recovery order -- Campus3 first, Campus2 second, Campus1 last -- maps to: Campus3 APs assigned priority 4 (Cisco's highest numeric value in the 4-tier system, equating to the highest service recovery priority in this context), Campus2 APs priority 2, and Campus1 APs priority 1 (lowest, recovered last). Option C correctly pairs the data center WLC with Campus1 WLC for SSO and assigns AP priorities in the correct descending recovery order.

QUESTION 6
An engineer is using Ekahau Site Survey to create a WLAN plan for a warehouse. The plan is to use patch antennas. Which setting is adjusted when simulated APs are placed on the map?

A. AP channel
B. Wi-Fi technology
C. antenna downtilt
D. AP transmission power

Answer: C
Explanation:
In Ekahau Site Survey, when planning a warehouse deployment using patch (directional) antennas, the antenna downtilt setting is the critical adjustment made when placing simulated APs on the floor plan map. Patch antennas have a defined radiation pattern with a main lobe that must be aimed precisely at the intended coverage zone. In a warehouse environment, APs with patch antennas are typically wall-mounted and aimed down aisles. The downtilt angle determines the vertical component of the antenna's aim -- adjusting the downtilt in Ekahau tilts the simulated antenna's main radiation lobe downward toward the warehouse floor and the working zone of RF scanner devices, rather than projecting RF energy horizontally at an ineffective angle. Ekahau allows engineers to specify the horizontal and vertical orientation of the antenna in three dimensions, and the downtilt value directly controls how the software models the antenna's coverage pattern in the vertical plane.

QUESTION 7
A network engineer must review the design for a Cisco wireless deployment at a hospital. The deployment will have two Cisco 9800 WLCs configured with SSO, one Cisco 9800 WLC joined to the SSO controllers using a mobility tunnel, and one Cisco 9800 WLC that will be used as a service/dev controller and not joined using a mobility tunnel. Which high availability option must be incorporated in the design to ensure that APs choose the service/dev controller last when trying to associate?

A. primary
B. tertiary
C. secondary
D. AP failover priority

Answer: B
Explanation:
In Cisco's AP controller preference hierarchy, each AP can be configured with a primary, secondary, and tertiary controller designation. The AP will attempt to join controllers in this exact order: primary first, secondary second, and tertiary third. When no controllers from the preference list are available, the AP may fall back to any reachable controller through standard CAPWAP discovery. In this hospital deployment, the service/development controller must be the controller of last resort -- it should only receive AP associations when all other options are exhausted. Configuring the service/dev controller as the tertiary controller in the APs' preference configuration ensures exactly this behavior:
APs will attempt the SSO pair (primary) first, then the third production WLC joined via mobility tunnel (secondary), and only then the service/dev controller (tertiary). This prevents development traffic from disrupting production service, and ensures production APs do not inadvertently join the service environment during partial outages.

QUESTION 8

An engineer is designing a high-density WLAN that must support 100 concurrent users with 100 Mbps throughput consistently. The design allows for 20 Mbps per cell and per channel on the 5 GHz band. How many channels must the design use to provide 1 Mbps per user prior to RF overhead?

A. 5
B. 10
C. 15
D. 20

Answer: A
Explanation:
This question requires straightforward wireless capacity engineering calculation. The total throughput requirement is 100 users ?1 Mbps per user = 100 Mbps aggregate. Each channel in the design can support 20 Mbps of usable throughput -- this is the per-cell, per-channel allocation defined in the design parameters, representing usable throughput prior to RF overhead as stated in the question. The number of channels required is therefore: total required throughput divided by throughput per channel = 100 Mbps ?20 Mbps per channel = 5 channels. In practice, each channel corresponds to a non-overlapping frequency assignment in the 5 GHz band. With 5 channels and 20 Mbps per channel, the design provides exactly 100 Mbps of aggregate capacity for 100 concurrent users at 1 Mbps each. This calculation methodology is foundational to Cisco's high-density WLAN design approach, where the number of spatial streams, channel allocations, and AP placement are all derived from the per-user throughput requirement multiplied by the concurrent user population.

QUESTION 9
A consultant must design a WLAN for a large campus with high AP density, 50-100 clients per cell, 5 Mbps throughput per client minimum, 5 GHz and 2.4 GHz coverage at -67 dBm, and no 802.11b clients. Which two WLAN design approaches meet the requirements? (Choose two.)

A. Set the minimum mandatory data rates to 12-18 Mbps.
B. Configure up to six SSIDs on any AP.
C. Enable 802.11b data rates.
D. Reduce the 2.4 GHz coverage with FRA.
E. Set the 5 GHz channel widths to 80-160 MHz.

Answer: AD
Explanation:
Designing for 50-100 clients per cell with 5 Mbps minimum throughput and no 802.11b clients requires two critical optimizations. First, setting minimum mandatory data rates to 12-18 Mbps (Option A) removes legacy lower data rates from the AP's supported rate set. When 1, 2, 5.5, and 11 Mbps rates are disabled and 12 Mbps becomes the minimum mandatory rate, clients that cannot achieve at least 12 Mbps are rejected from the cell, maintaining throughput standards. Without this, a single 802.11b client operating at 1 Mbps can consume an inordinate share of airtime and reduce throughput for all other clients below the required minimum. Second, Flexible Radio Assignment (FRA) for 2.4 GHz reduction (Option D) is critical in high-density environments. FRA allows the WLC to dynamically reassign some 2.4 GHz radios to 5 GHz operation or monitor mode, reducing 2.4 GHz cell size and interference while increasing 5 GHz capacity.

QUESTION 10
A consulting engineer for a copper mine is trying to extend the network connectivity of autonomous trucks via Cisco IW3702 APs. The WGB design requirements include: latency-

sensitive application (truck slows at 10 sec, stops at 20 sec of connection loss), aggressive scanning and roaming, enterprise-grade security without certificates on each AP, multiple clients in different VLANs on the WGB, and channel scan parameters restricted to only channels in the truck path. Which design approach meets the requirements?

A. WGB in mobile station mode with EAP Fast connected to a dot1q-capable switch
B. WGB in mobile station mode with EAP-TLS connected to a dot1q-capable switch
C. WGB in static mode with EAP Fast connected to a dot1q-capable switch
D. WGB in static mode with EAP-TLS connected to a dot1q-capable switch

Answer: A
Explanation:
This WGB (Workgroup Bridge) design scenario requires satisfying multiple simultaneous constraints. EAP-FAST (Flexible Authentication via Secure Tunneling) is the correct authentication protocol because it provides enterprise-grade 802.1X security using protected access credentials (PAC) without requiring a certificate to be installed on each AP or WGB device -- directly satisfying the enterprise-grade security without certificates requirement. EAP-TLS (Options B and D) requires client certificates on every authenticating device, which is explicitly excluded. Mobile station mode is required rather than static mode (Options C and D) because mobile station mode enables the WGB to aggressively scan and roam to optimal mesh neighbors dynamically, evaluating neighbor signal quality and switching to better RAPs/MAPs as the truck moves along its path. Static mode fixes the WGB to a specific channel or AP, preventing the aggressive scanning and roaming required for the latency-sensitive application. The dot1q-capable switch connection supports multiple clients in different VLANs via 802.1Q VLAN tagging between the WGB and the truck's local network switch.

QUESTION 11
A customer has two Cisco WLCs configured in a SSO cluster. The wireless network supports a large warehouse. The customer purchases new iPads to replace legacy scanners. Both devices connect to a single SSID named Scanning by using WPA2 Personal. The customer wants to use a standards-based method for fast roaming on the new iPads. Which approach meets the scanner requirement and still supports the legacy scanners?

A. Enable FT 802.1X and set Fast Transition to Adaptive for the Scanning SSID.
B. Enable optimized roaming globally and enable FT 802.1X on the Scanning SSID.
C. Enable optimized roaming globally and enable FT PSK on the Scanning SSID.
D. Enable FT PSK and set Fast Transition to Adaptive for the Scanning SSID.

Answer: D
Explanation:
The design challenge is enabling IEEE 802.11r Fast BSS Transition for the new iPads (the standards- based fast roaming method) while maintaining backward compatibility for legacy RF scanners that may not support 802.11r. The SSID uses WPA2 Personal (PSK), not 802.1X enterprise authentication -- therefore the correct Fast Transition variant is FT PSK (pre-shared key), not FT 802.1X (Options A and B). The critical configuration parameter is setting Fast Transition to Adaptive mode rather than mandatory. Adaptive mode is a Cisco feature that allows the AP and SSID to support both 802.11r- capable clients (which will use FT PSK for fast roaming) and non-802.11r legacy clients (which will use the standard pre-FT roaming process). In Adaptive mode, legacy scanners that cannot negotiate 802.11r during association will fall back transparently to standard roaming, while the new iPads leverage FT PSK for minimal-interruption handoffs. If Fast Transition is set to mandatory, legacy clients that do not support 802.11r will fail to associate entirely. Option C uses optimized roaming globally, which is a different mechanism and does not address the iPads' specific need for a standards-based fast roaming solution.

QUESTION 12
In a FlexConnect deployment, which role does the site tag play?

A. It configures the switch port settings for FlexConnect APs.
B. It assigns IP addresses to wireless clients for the site APs.
C. It manages the firewall policies for the site APs.
D. It defines the roaming domain for FlexConnect APs.

Answer: D
Explanation:
In the Cisco Catalyst 9800 IOS XE WLC configuration framework, the site tag serves as the primary organizational and functional grouping element for FlexConnect APs at a given physical location. The site tag defines the FlexConnect site -- a logical boundary within which APs can perform local switching and local inter-AP roaming without requiring CAPWAP tunnel traversal to the WLC for every client handoff. Within a FlexConnect site defined by the site tag, APs can exchange client roaming context information directly with each other (peer-to-peer), enabling fast Layer 2 roaming for clients moving between APs that share the same site tag -- effectively defining the roaming domain for FlexConnect APs at that site. The site tag also references the flex profile (which defines VLAN mappings, local auth settings, and split tunneling parameters) and the AP join profile.

QUESTION 13
A network design supports data and voice in 2.4 GHz and 5.0 GHz. The design must support asset tracking without affecting the existing design. Which action must be taken?

A. Add more monitor mode APs to the perimeter of the area.
B. Add more local mode APs to the perimeter of the area.
C. Use more APs grouped closer together.
D. Increase the transmission power of the existing APs.

Answer: A
Explanation:
Cisco's WLAN location and asset tracking architecture (based on Cisco Spaces or legacy Cisco MSE/CMX) relies on the ability to receive and measure the RF signal from tagged assets at multiple APs simultaneously. For accurate location determination using triangulation or trilateration algorithms, a minimum of three APs must receive the tag's signal with sufficient RSSI. Monitor mode APs are dedicated to passive RF listening -- they do not transmit client-serving SSIDs and focus their full radio attention on scanning all channels for signal measurement. Placing monitor mode APs specifically on the perimeter of an asset tracking area provides the spatial diversity and boundary detection capability needed to accurately triangulate assets throughout the interior, without requiring any modifications to the existing data/voice serving APs. Adding monitor mode APs at the perimeter as an overlay ensures the existing 2.4 GHz and 5 GHz voice/data design is entirely undisturbed.

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