CCNA 200-301 Free Sample (30 Questions)

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This free sample contains 30 of the 900 questions from the full CCNA 200-301 question bank.

Q1. A user reports very slow file transfers on a newly patched workstation. The switch interface connected to it shows a rapidly rising count of late collisions but almost no early collisions, and the link itself stays up. The workstation NIC is hard-coded to 100 Mbps full duplex. What is the most likely cause?

A) The cable run exceeds 100 meters, adding propagation delay
B) The switch port is half duplex, creating a duplex mismatch
C) Untwisted pairs at the punch-down block causing crosstalk
D) A faulty uplink SFP is flapping and dropping link pulses
Correct answer: B
Explanation: Late collisions occur only in half-duplex operation when a station transmits after the 512-bit collision window has passed, which is the classic signature of a duplex mismatch where one side is forced to full duplex and the other falls back to half. Excessive cable length causes link drops and errors rather than late collisions, untwisted pairs cause crosstalk and FCS errors, and a faulty uplink SFP would not produce late collisions on this access port.

Q2. Two buildings are 3 km apart and need a 10 Gbps fiber link. A technician has both OM4 multimode and OS2 single-mode cable on hand. Which cable should be used, and why?

A) OS2 single-mode fiber, because 10GBASE-SR over multimode is limited to a few hundred meters
B) OM4 multimode fiber, because its 50-micron core carries 10 Gbps farther than single-mode
C) OM4 multimode fiber with mode-conditioning patch cords to extend the reach to 3 km
D) Either fiber type, because 10 Gbps operates at the same wavelength on both
Correct answer: A
Explanation: Single-mode OS2 fiber paired with 10GBASE-LR optics supports 10 Gbps up to 10 km, while OM4 multimode with 10GBASE-SR tops out around 400 meters. Mode-conditioning cords address differential mode delay on legacy fiber rather than distance limits, and the two fiber types use different core sizes, wavelengths, and optics that are not interchangeable.

Q3. A company is rewiring an office to support 10GBASE-T to the desktop with cable runs up to 80 meters. Which minimum cable category meets the requirement?

A) Cat5
B) Cat5e
C) Cat6
D) Cat6a
Correct answer: D
Explanation: Cat6a is rated for 10GBASE-T up to the full 100 meters, while Cat6 only supports 10GBASE-T up to about 55 meters because of alien crosstalk at higher frequencies. Cat5 and Cat5e top out at 1 Gbps, so only Cat6a satisfies an 80-meter 10 Gbps requirement.

Q4. A router's Ethernet interface shows a steady climb in CRC errors and input errors, but the link never drops and collisions are zero. The cable is Cat5e running near fluorescent light ballasts. What should the engineer check first?

A) Whether the duplex settings match on both ends of the link
B) Whether the switch port has been error-disabled by the switch
C) The cable is damaged or picking up EMI; replace or reroute it
D) Whether the interface needs a shutdown followed by no shutdown
Correct answer: C
Explanation: CRC and input errors with zero collisions point to Layer 1 signal corruption on the receive path, such as EMI from the ballasts, a damaged cable, or a bad connector. A duplex mismatch would show late collisions rather than clean CRC errors, an error-disabled port would take the link down, and bouncing the interface does not repair physical-layer corruption.

Q5. After replacing a failed fiber uplink module, the link stays down/down even though the fiber itself tested good. The old module was 1000BASE-SX; the new module installed on one side is 1000BASE-LX while the far side still has 1000BASE-SX. What is the most likely cause?

A) The transceivers use incompatible wavelengths and cannot link
B) The fiber cable must be recertified for single-mode use first
C) The switch port is in an err-disabled state from a previous loop
D) The interface MTU must be raised to match the new wavelength
Correct answer: A
Explanation: 1000BASE-SX uses 850 nm multimode optics while 1000BASE-LX uses 1310 nm optics, so the two ends cannot interoperate and the link stays down. The fiber already tested good, an err-disabled port would show a distinct status, and MTU has no relationship to optical wavelength.

Q6. A technician hard-codes a switch port to 1000 Mbps full duplex, but the connected older printer only supports 100 Mbps. The link will not come up. What is the most likely cause?

A) The duplex settings disagree between the two devices
B) A straight-through cable is required instead of a crossover
C) The printer needs a static IP address before the link comes up
D) The forced 1000 Mbps speed exceeds the printer's 100 Mbps NIC
Correct answer: D
Explanation: Hard-coding the switch port to 1000 Mbps disables autonegotiation on that side, and the 100 Mbps printer cannot link to a port signaling at a rate its NIC does not support. The fix is to set both sides to auto or to a mutually supported speed, whereas duplex disagreement degrades performance rather than preventing link, and IP addressing is irrelevant to Layer 1 link establishment.

Q7. An engineer runs show interfaces on a switch port and sees "input errors 15234, CRC 15200, frame 0, overrun 0, ignored 0" with zero collisions. Which conclusion is best supported?

A) A duplex mismatch is causing late collisions on the segment
B) The port is congested and dropping queued outbound traffic
C) Layer 1 or 2 receive-path corruption, likely a bad cable
D) The port needs a larger output queue to absorb traffic bursts
Correct answer: C
Explanation: CRC errors nearly equal to input errors, with no collisions and no frame errors, indicates corrupted frames arriving at the receiver, which is a physical-layer problem such as a damaged cable, bad connector, or failing NIC. A duplex mismatch would produce late collisions, and congestion would appear as output drops rather than input errors.

Q8. A network engineer connects two switches with a straight-through Cat6 cable and the link stays down. Both ports are set to auto-negotiate, and neither port supports Auto-MDIX. What is the most likely cause of the failed link?

A) The cable category is too high for these older switch ports
B) No Auto-MDIX on either port, so a crossover cable is required
C) The cable must be shielded for switch-to-switch connections
D) The switches require single-mode fiber for inter-switch links
Correct answer: B
Explanation: Switch-to-switch is a like-device connection that needs the transmit and receive pairs crossed; without Auto-MDIX on either side, a straight-through cable cannot link up and a crossover cable is required. Cable category and shielding do not affect pinout, and fiber is not required for short copper switch links.

Q9. A fiber link between two switches shows one side up and the other side down. The technician verifies both SFPs are identical 10GBASE-SR modules and the fiber tests clean. Swapping the transmit and receive strands at one patch panel brings the link up on both sides. What was the fault?

A) A duplex mismatch between the two switches on the link
B) Reversed fiber polarity, with transmit wired to transmit
C) The wrong wavelength SFP installed on one side of the link
D) An MTU mismatch on the trunk between the two switches
Correct answer: B
Explanation: Fiber links require transmit to connect to receive; with Tx wired to Tx, one side receives nothing and the link appears one-sided until polarity is corrected. Duplex is irrelevant on full-duplex fiber, the wavelengths were verified identical, and an MTU mismatch affects payload forwarding rather than link state.

Q10. A 10 Gbps copper uplink runs 90 meters over Cat6 and experiences frequent FCS errors, while a shorter Cat6 run on the same switch is clean. What is the best fix?

A) Replace with Cat6a: Cat6 supports 10GBASE-T only to ~55 meters
B) Force both ends down to 1000 Mbps to reduce the error rate
C) Install a repeater at the 45-meter mark of the long run
D) Enable jumbo frames to reduce the frame error rate on the link
Correct answer: A
Explanation: 10GBASE-T over Cat6 is distance-limited to roughly 55 meters due to alien crosstalk, while Cat6a is rated for 10 Gbps to the full 100 meters. Downgrading the speed sidesteps the requirement instead of fixing it, and jumbo frames do nothing to correct signal corruption on an out-of-spec run.

Q11. The command show ip interface brief shows GigabitEthernet0/1 as "down/down". The cable is known good and firmly plugged in. What should be checked first?

A) The IP address assigned to the interface for management
B) The routing table for a missing route to the segment
C) The duplex setting negotiated on the port by the peers
D) The interface may be shut down, or the far end is down
Correct answer: D
Explanation: A down/down status means no physical link is detected, so Layer 3 configuration and routing are irrelevant until Layer 1 is restored. Before replacing hardware, confirm the port is not administratively shut down and that the far-end device is actually powered on and sending link pulses.

Q12. A half-duplex hub-connected segment shows a high count of collisions but zero late collisions, and users report slow but functional connectivity. What does this indicate?

A) A faulty cable is corrupting frames on the segment
B) A duplex mismatch exists somewhere on the segment
C) Normal CSMA/CD contention on a busy half-duplex segment
D) A broadcast storm caused by a switching loop
Correct answer: C
Explanation: Collisions are an expected part of CSMA/CD on half-duplex shared media and only become a fault indicator when they occur late, after the 512-bit collision window. Corrupted frames would appear as CRC errors, a duplex mismatch produces late collisions, and a broadcast storm would show as excessive broadcasts rather than collisions.

Q13. An installer pulls a 95-meter horizontal run from the patch panel to a wall jack for a new Gigabit Ethernet drop, plus 3-meter patch cords on each end. What is the concern with this installation?

A) The 95 m horizontal run exceeds the 90 m guideline
B) Gigabit Ethernet requires fiber for any run beyond 50 meters
C) Patch cords do not count toward the distance limit at all
D) Cat6 cable cannot support Gigabit Ethernet at any distance
Correct answer: A
Explanation: Structured cabling standards allow 90 meters of horizontal cable plus 10 meters of patch cords for a 100-meter channel, so a 95-meter horizontal run is out of spec and can cause intermittent errors. Gigabit Ethernet runs fine on copper to 100 meters, patch cords do count toward the channel length, and Cat6 supports 1 Gbps to the full 100 meters.

Q14. The command show interfaces reports a rising count of runts on a FastEthernet port, with no giants and no CRC errors. What do runts indicate, and what is a likely cause?

A) Oversized frames from jumbo-frame misconfiguration; check MTU
B) Corrupted frames from EMI on the link; replace the cable
C) A duplex mismatch; check the speed and duplex settings
D) Undersized frames, often from a duplex mismatch or faulty NIC
Correct answer: D
Explanation: Runts are frames smaller than 64 bytes, commonly produced by collisions on a half-duplex segment suffering a duplex mismatch or by a malfunctioning NIC or driver truncating frames. Giants indicate oversize or MTU problems, while EMI corruption typically shows up as CRC errors rather than clean undersized frames.

Q15. A switch uplink shows the "output drops" counter climbing during business hours while input errors stay at zero. Link speed and duplex match on both ends. What is the most likely cause?

A) A faulty cable on the uplink dropping outbound frames
B) A duplex mismatch with the upstream switch on the port
C) Congestion: traffic arriving faster than the uplink forwards
D) EMI from nearby power cables corrupting the transmitted signal
Correct answer: C
Explanation: Output drops with zero input errors mean the port is discarding frames it cannot transmit fast enough, which is the classic signature of congestion or oversubscription rather than a physical-layer fault. Cable, duplex, or EMI problems would raise input and CRC error counters instead.

Q16. A switch port with an SFP+ slot is fitted with a 1 Gbps SFP module, but the link to the 10 Gbps core switch will not come up. What is the likely problem?

A) The fiber strand count in the cable is wrong for the link
B) The 1 Gbps optic cannot link at 10 Gbps; match the rates
C) The switch needs a firmware upgrade to enable the SFP+ slot
D) Single-mode fiber is required for all SFP+ slots on the switch
Correct answer: B
Explanation: SFP (1 Gbps) and SFP+ (10 Gbps) modules use different signaling rates and will not link across that rate gap, so both ends must operate at a common rate with matching optics. Strand count, firmware, and fiber type were not indicated as faults, and SFP+ slots commonly accept multimode optics.

Q17. A switch port flaps up and down every few minutes. The cable runs across a ceiling near HVAC motors, and the error counters spike whenever the motors start. Replacing the NIC did not help. What is the most likely cause?

A) A spanning-tree reconvergence event on the switch
B) EMI from the motors corrupting the unshielded cable run
C) DHCP scope exhaustion on the segment blocking clients
D) A routing protocol adjacency flap with the neighbor router
Correct answer: B
Explanation: Link flaps tightly correlated with motor starts point to electromagnetic interference disrupting the physical-layer signal, especially on an unshielded run routed near inductive equipment. Spanning-tree events do not flap the physical link, and DHCP or routing problems cannot take a link up and down.

Q18. A technician terminates both ends of a Cat6 cable to the T568B standard and tests it as a good straight-through cable. Connecting a PC to a switch works, but connecting two PCs directly fails even with static IPs configured. Why?

A) PC-to-PC is a like-device link needing crossover or Auto-MDIX
B) The T568B standard is only valid for telephone wiring, not Ethernet
C) Cat6 cable cannot carry IP traffic directly between two PCs
D) The cable must be re-terminated to T568A on both ends instead
Correct answer: A
Explanation: A straight-through cable maps transmit to transmit on like devices, so without Auto-MDIX the two NICs cannot hear each other and the link fails. T568B is a valid Ethernet wiring standard, Cat6 carries IP traffic normally, and T568A on both ends is still a straight-through cable.

Q19. A data center needs 10 Gbps links up to 300 meters between racks in different rooms. Which fiber and optic combination is appropriate?

A) OS2 single-mode fiber with 1000BASE-SX optics
B) OM2 multimode fiber with 10GBASE-LR optics
C) OM4 multimode fiber with 10GBASE-T copper modules
D) OM3 or OM4 multimode fiber with 10GBASE-SR optics
Correct answer: D
Explanation: 10GBASE-SR optics reach 300 meters over OM3 and 400 meters over OM4, which satisfies the requirement. 1000BASE-SX optics are only 1 Gbps, 10GBASE-LR optics require single-mode fiber, and 10GBASE-T is a copper standard rather than a fiber optic.

Q20. A router's Ethernet interface shows a high "ignored" counter but zero CRC errors and zero collisions. What does this typically indicate?

A) Corrupted frames arriving from a damaged or faulty cable
B) A duplex mismatch with the far-end device on the link segment
C) The interface drops packets; receive buffers are exhausted
D) The far end is sending frames larger than the interface MTU allows
Correct answer: C
Explanation: The "ignored" counter tracks packets dropped because no receive buffers were available, which is a device resource or congestion issue rather than a media problem. Corrupted frames raise CRC counters, duplex problems raise collision counters, and oversize frames would appear as giants.

Q21. The command show interfaces status shows a port as "a-100" speed and "a-half" duplex on a modern full-duplex switch connected to a server. The server team reports poor throughput. What is the best next step?

A) Check for a duplex mismatch; set both sides to auto or full
B) Replace the Cat6a cable with a higher-category Cat8 cable run
C) Increase the interface MTU to 9000 bytes for throughput
D) Add a second uplink to the server for link redundancy
Correct answer: A
Explanation: Half-duplex autonegotiation on modern equipment usually means one side has

autonegotiation disabled through hard-coding, producing a duplex mismatch with late collisions and poor throughput. Cable category and MTU do not cause half-duplex negotiation, and adding links does not fix the mismatch.

Q22. A technician needs to connect a new 10GBASE-SR SFP+ module to existing multimode patch panels. The module has an LC receptacle but the panel uses SC connectors. What is needed?

A) A media converter to change the module's optical wavelength type
B) A new single-mode cable plant between the patch panels
C) A crossover copper cable to link the two patch panels
D) An LC-to-SC fiber patch cable of the matching multimode type
Correct answer: D
Explanation: Only the connector form factor differs here, so a hybrid LC-to-SC multimode patch cord bridges the two with no other changes. No wavelength conversion or new cable plant is required, and a copper crossover is irrelevant to a fiber connection.

Q23. A switch supports cable diagnostics (TDR) on copper ports. An engineer runs the test on a port with intermittent errors and the test reports an open at 37 meters. What does this mean?

A) The switch port itself is faulty at the 37-meter mark
B) The installed cable is 37 meters longer than the design allows
C) A break or bad termination 37 meters from the switch
D) The far-end device is 37 meters away and powered off
Correct answer: C
Explanation: Time-domain reflectometry measures signal reflections to locate opens and shorts, so an open at 37 meters means the conductor is broken or improperly terminated at that distance along the run. The next step is inspecting jacks, patch panels, and cable near that point, since TDR does not diagnose the port itself or the far-end power state.

Q24. Two switches are connected by a trunk. One side is hard-coded to 100 Mbps full duplex while the other side is set to auto-negotiate. The link is up but throughput is terrible and both sides log FCS errors. What is happening?

A) The trunk encapsulation types mismatch between the switches
B) The auto side fell back to half duplex: a duplex mismatch
C) The cable run is too long to reliably support 100 Mbps
D) VLAN pruning is discarding the traffic on the trunk
Correct answer: B
Explanation: A hard-coded side sends no autonegotiation fast link pulses, so the auto side falls back to half duplex while keeping the detected speed, which is the classic duplex mismatch producing FCS errors and late collisions. Trunk encapsulation and VLAN pruning do not cause FCS errors, and 100-meter copper easily supports 100 Mbps.

Q25. A technician must identify unlabeled fiber jumpers. One set has a yellow jacket and the other has an orange jacket. Which is which?

A) Yellow is multimode OM3; orange is single-mode OS2
B) Yellow is single-mode fiber; orange is legacy multimode OM1/OM2
C) Yellow is OM4; orange is OS2
D) Jacket color indicates the connector type, not the fiber type
Correct answer: B
Explanation: Industry convention uses yellow jackets for single-mode OS1/OS2 fiber and orange jackets for legacy multimode OM1/OM2, with aqua or violet used for OM3/OM4. Jacket color identifies the fiber type rather than the connector.

Q26. A warehouse needs a 150-meter link between two switches with no intermediate power available for a repeater. Which is the best solution?

A) Use fiber with appropriate optics; copper is limited to 100 m
B) Use Cat6a cable, which is rated for 150 meters at 1 Gbps
C) Chain two 75-meter Cat5e cables together with a coupler
D) Force the ports to 10 Mbps to extend copper reach to 150 meters
Correct answer: A
Explanation: Twisted-pair Ethernet segments are limited to 100 meters regardless of category or speed, so fiber with suitable optics is the correct choice for a 150-meter run. Couplers do not extend the 100-meter channel limit, and lowering the speed does not change the distance specification.

Q27. A Gigabit Ethernet link negotiates only 100 Mbps even though both NICs support 1000 Mbps and are set to auto-negotiate. The cable is an older Cat5 installed years ago. What is the most likely cause?

A) A duplex mismatch between the two devices on the link
B) The switch port is in the error-disabled state on the switch port
C) Spanning tree is blocking the port for the VLAN traffic
D) Damaged pairs: gigabit needs four pairs, 100 Mbps needs two
Correct answer: D
Explanation: 1000BASE-T requires all four wire pairs, while 100BASE-TX needs only two, so a damaged or badly terminated pair causes autonegotiation to settle at 100 Mbps. A duplex mismatch affects performance rather than negotiated speed, and error-disabled or spanning-tree blocking states would prevent the link from passing traffic at all.

Q28. The command show interfaces shows "reliability 180/255" on a switch port along with rising CRC errors. What does the reliability value indicate?

A) The percentage of available bandwidth remaining on the link now
B) The result of the duplex negotiation on the switch port
C) A falling error-free transmission ratio matching CRC errors
D) The remaining operational lifespan of the SFP module
Correct answer: C
Explanation: The reliability metric is a 255-based measure of error-free transmission, so a falling value

alongside CRC errors confirms that frames are being corrupted on the wire. This points to investigating cabling, connectors, or the NIC rather than bandwidth, duplex display values, or optic lifespan.

Q29. A cable certifier reports a "split pair" fault on a newly terminated Cat6 run. What does this mean?

A) Wires from different pairs mixed at termination
B) The cable has been cut and split into two separate segments
C) The cable run exceeds the maximum rated length for Cat6
D) Two cables have been spliced together somewhere in the run
Correct answer: A
Explanation: A split pair means conductors from different twisted pairs were crossed during termination, for example pins 3 and 6 taken from different pairs, which destroys the crosstalk cancellation the twists provide. It is a termination wiring error rather than a length problem or a splice.

Q30. A new link must cross a factory floor with heavy welders and run 400 meters to a remote building. Which medium is the best choice?

A) Shielded Cat6a twisted pair
B) Coaxial cable
C) A 2.4 GHz wireless bridge
D) Single-mode fiber
Correct answer: D
Explanation: Fiber is immune to electromagnetic interference and easily spans 400 meters, while even shielded copper is limited to 100-meter segments. Coaxial cable is not used for modern Ethernet LAN links, and a wireless bridge is less reliable than fiber for a fixed 400-meter run in an industrial environment.