Lecture 9 BGP Implementation and IP Header Quiz ANS

1. Which statement best distinguishes eBGP from iBGP?
A. eBGP is used inside one AS, while iBGP is used between different ASes.
B. eBGP is between routers in different ASes, while iBGP distributes externally learned routes within the same AS.
C. eBGP computes shortest internal paths, while iBGP computes least-cost AS paths.
D. eBGP carries only local attributes, while iBGP carries only destination prefixes.
ANS: **B.** eBGP is between different ASes, while iBGP distributes externally learned routes inside the same AS.

2. What is the main role of an IGP in Lecture 9?
A. To advertise prefixes to neighboring ASes.
B. To find internal routes within the AS.
C. To choose the best MED among providers.
D. To replace BGP entirely.
ANS: **B.** IGP is used for intra-domain routing, meaning it finds paths within the AS.

3. What is an egress router for a destination?
A. The router with the smallest IP address in the AS.
B. A border router that can reach the external destination.
C. The first router that receives the packet at Layer 2.
D. A router that only speaks iBGP.
ANS: **B.** An egress router is a border router that can reach that outside destination.

4. When sending to an external destination, what does a router do first in the two-table model?
A. Use the IGP table to find the final destination directly.
B. Use ARP to find the neighboring AS.
C. Use the BGP table to find the egress router, then use the IGP table to reach it.
D. Use the MED field as the next hop.
ANS: **C.** The BGP table picks the egress router, and the IGP table gives the internal next hop to that egress.

5. Why can the simple iBGP implementation become a scaling problem?
A. It requires a checksum for every route.
B. It requires roughly N × B sessions in the simple model.
C. It forces routers to build new physical links.
D. It requires every router to be a border router.
ANS: **B.** The simple design runs many iBGP sessions, about N × B, which can become expensive at scale.

6. What is the idea behind hot potato routing?
A. Keep packets inside your own AS as long as possible.
B. Prefer the route with the largest MED.
C. Prefer the shortest ASPATH only.
D. Get rid of the packet as quickly as possible using the nearest egress router.
ANS: **D.** Hot potato routing means an AS prefers the nearest egress so it uses less of its own bandwidth.

7. What does MED represent?
A. The size of the BGP routing table.
B. The distance from the announcing router to the destination, where lower is preferred.
C. The number of ASes in the path, where higher is preferred.
D. The TTL of a BGP update.

ANS: **B.** MED is the distance from the announcing router to the destination, and lower values are preferred.

8. Which BGP route attribute is local and used to encode policy preference such as Gao-Rexford ranking?
A. ASPATH.
B. LOCAL PREFERENCE.
C. MED.
D. TTL.
ANS: **B.** LOCAL PREFERENCE is used inside the AS to rank routes according to policy.

9. Which BGP message type announces a new route, updates an old route, or withdraws a route?
A. Open.
B. KeepAlive.
C. Notification.
D. Update.
ANS: **D.** Update messages carry route announcements, modifications, and withdrawals.

10. In the import policy order, which rule is considered first?
A. Shortest ASPATH.
B. Lowest router IP address.
C. Gao-Rexford preference through highest LOCAL PREF.
D. Lowest MED.
ANS: **C.** Policy comes first, and that is represented through LOCAL PREFERENCE.

11. Which IPv4 header field tells the destination which Layer 4 protocol should process the payload?
A. Total Length.
B. Protocol.
C. Header Length.
D. Identification.
ANS: **B.** The Protocol field de-multiplexes the payload to TCP, UDP, or another Layer 4 protocol.

12. What is the main purpose of TTL in IPv4?
A. To indicate the packet priority.
B. To identify all fragments of one packet.
C. To prevent indefinite forwarding loops by limiting hop count.
D. To measure propagation delay.
ANS: **C.** TTL is decremented at each hop so looping packets eventually expire.

13. In IPv4 fragmentation, which statement is correct?
A. Each fragment gets a different ID.
B. Fragment offsets are measured in bytes.
C. All fragments of the same packet share an ID, and offsets are measured in multiples of 8 bytes.
D. Fragmentation is done only by the destination host.
ANS: **C.** IPv4 fragments from the same original packet share one ID, and offsets are measured in 8-byte units.

14. Which set of changes is part of the IPv6 cleanup described in Lecture 9?
A. Add checksums, expand options, and keep router fragmentation.
B. Remove checksums, remove router fragmentation, and remove options in favor of next-header processing.
C. Reduce address size from 32 bits to 16 bits.
D. Replace hop limit with MED.
ANS: **B.** IPv6 removes IP-header checksums, router fragmentation, and options, while using next-header style extensibility.

15. Which security problem is associated with the source IP address field?
A. Traceroute.

B. Spoofing.
C. Flow labeling.
D. Header compression.
ANS: **B.** Spoofing means lying about the source address to impersonate someone else or hide the sender.