Tutorial 5 Solution

Question 1

The 8-bit "upper-layer protocol" field in IPv4 datagram, or the 8-bit "next header" field in IPv6 datagram, contains information about which transport layer protocol the destination host should pass the segment to. Value is 6 for TCP, and 17 for UDP.

Question 2

The "time-to-live" (TTL) field in IPv4 datagram is decremented by 1 each time the datagram is processed by a router. If TTL reaches 0, a router must drop that datagram. Similarly, the "hop limit" field in IPv6 datagram is decremented by 1 by each router that forwards the datagram. If the hop limit count reaches 0, the datagram is discarded.

Question 3

(a)
Subnet A: 214.97.255/24 (256 addresses)
Subnet B: 214.97.254.0/25 – 214.97.254.0/29 (128 – 8 = 120 addresses)
Subnet C: 214.97.254.128/25 (128 addresses)
Subnet D: 214.97.254.0/31 (2 addresses)
Subnet E: 214.97.254.2/31 (2 addresses)
Subnet F: 214.97.254.4/30 (4 addresses)

(b)

Router 1

Longest prefix match	Outgoing interface
11010110 01100001 11111111	Subnet A
11010110 01100001 11111110 0000000	Subnet D
11010110 01100001 11111110 000001	Subnet F

Router 2

Longest prefix match	Outgoing interface
11010110 01100001 11111110 0000000	Subnet D
11010110 01100001 11111110 0	Subnet B
11010110 01100001 11111110 0000001	Subnet E

Router 3

Longest prefix match	Outgoing interface
11010110 01100001 11111110 000001	Subnet F
11010110 01100001 11111110 0000001	Subnet E
11010110 01100001 11111110 1	Subnet C