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Computer Network HW04

1. (a) version ⇒ 4 bits
Internet Header length ⇒ 4 bits
Type of Service ⇒ 8 bits
Total length ⇒ 16 bits
Identification ⇒ 16 bits
Flags ⇒ 3 bits
Fragment offset ⇒ 13 bits
Time to Live (TTL) ⇒ 8 bits
Upper Layer Protocol ⇒ 8 bits
Header Checksum ⇒ 16 bits
Source IP address ⇒ 32 bits
Destination IP address ⇒ 32 bits

Total ⇒ 160 bits = 20 Bytes #

(b) Packets can be discarded after a certain time count to avoid wasted network resources and potential network congestion.
Each time a packet passes through a router, the TTL field of the packet is decremented by 1. If the TTL is 0, the packet is discarded; otherwise, it is forwarded according to the route.

2. subnet 1 : 223.3.16.0/25
subnet 2 : 223.3.16.128/26
subnet 3 : 223.3.16.192/26

3. Private network address are IP addresses used within internal networks. If they connect to public networks, there may be address conflicts and security issues.

4. (a) IPv6 is encapsulated into an IPv4 packet, transmitted to the reciever, and then decapsulated at the reciever to obtain the original IPv6.

(b) Yes

5. Match Plus Action ⇒ refers to the operation in routers or switches where they process packets by matching certain fields in the packet header and then performing specific actions based on the match results.

e.g. source IP ⇒ forward to the appropriate output interface.
upper layer protocol ⇒ modify the packet header