NASA: NA Preliminary Part

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True/False

1. references: http://stackoverflow.com/questions/24879959/what-is-overhead-payload-and-header

   False. The download speed is limited by the source's upload bandwidth and the destination's download bandwidth, so if the file's upload bandwidth is less than 100Mbps, then I can't download it with 100Mbps.

2. references: https://en.wikipedia.org/wiki/IP_address
   https://ist.mit.edu/network/ip

   False. Public IP addresses of devices connecting to the same router are the same, so others won't detect those devices only with the IP addresses.

3. references: https://en.wikipedia.org/wiki/Dynamic_Host_Configuration_Protocol
   https://en.wikipedia.org/wiki/Gateway_(telecommunications)
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   True. Without DHCP, devices need to be statically assigned IP addresses, but it's necessary to have the gateway to communicate to other networks which may use different protocols.

4. references: https://en.wikipedia.org/wiki/MAC_address
   https://supportforums.cisco.com/blog/153276/what-happens-when-router-receives-packet

   False. The destination mac address of a packet will be changed many times while passing routes. An end device should judge by the packet's destination IP address.

5. references: https://en.wikipedia.org/wiki/Hub_(network_science_concept)
   https://en.wikipedia.org/wiki/Network_switch
   http://www.diffen.com/difference/Hub_vs_Switch

   False. Hub is in physical layer connecting PCs, while switch is in data link layer or network layer receiving, processing and forwarding dataz to the destination device.

6. references: https://www.quora.com/How-does-the-internet-work-without-DNS

   True. One can do that if he/she knows the IP address of the sites.

7. references: https://en.wikipedia.org/wiki/IEEE_802.11

   False. Since 802.11ac only uses 5GHz band, maintaining 802.11b/g/n has the benefit of utilizing 2.4GHz band.

8. references: https://en.wikipedia.org/wiki/Firewall_(computing)

   True. A firewall filters packets with some predetermined rules based only on information contained in the packet itself.

9. references: https://en.wikipedia.org/wiki/Name_server

   False. A DNS server doesn't store all records in the world. Internet name servers implement the Domain Name Service, which means there are many DNS servers to constitute DNS.

10. references: https://en.wikipedia.org/wiki/Dynamic_Host_Configuration_Protocol

    True. DHCP clients can request DHCP servers for Domain Name Servers' addresses.

11. references: https://en.wikipedia.org/wiki/Wi-Fi_Protected_Access

    True. WPA2 is a wifi security protocol, which encrypts the data.

12. references: https://www.howtogeek.com/253195/how-can-a-vpn-improve-download-speed/

    True. VPN is often used for those purposes, and it sometimes enhance the download speed with some possible reasons, such as the origin connection is constrained by other connections.

13. references: https://en.wikipedia.org/wiki/Network_address_translation
    https://www.quora.com/If-two-computers-in-the-same-local-area-network-try-to-connect-to-each-other-do-they-have-to-go-through-a-router

    True. Devices on the same logical IP network can find each other with a discovery protocol without involving a router, which means they don't need NAT to connect with each other.

14. references: https://en.wikipedia.org/wiki/IPv4

    True. Minimum IPv4 packet's header size = 5 * 32 bits = 20 bytes, which means the size of data in packets is about 50% or less. It's inefficient and thus abnormal.

Select All That Apply

1. references: None

   Answer: c,d,e

2. references: https://en.wikipedia.org/wiki/Private_network

   Answer: a,c

3. references: https://en.wikipedia.org/wiki/Network_Time_Protocol
   https://en.wikipedia.org/wiki/Voice_over_IP
   https://en.wikipedia.org/wiki/Carrier-grade_NAT

   Answer: a,d