Question 1 - Where will the Router send a packet destined for 10.1.5.65

IP address 10.1.5.65 belongs to 10.1.5.65/28, /29, /27

Using the Longest prefix match and 10.1.5.65/29 will be chosen as it has most bits Matching => Convert To binary And see which match the most.

Next hop = 10.1.3.3

Question 2 - CIDR Receives a packet with Add: 131.25.151.76. What is the identifier.

Identifier = 1.

Explanation: 1st entry in table: 131.16.0.0/12. its Mask is first 12 bits of Network and Remaining 20 are host.

131.23.151.76 = 131.16.0.0. Last entry is 181.22.0.0/15 So the Mask = 255.254.0.0

and 131.23.151.76 = 131.22.0.0

Using Longest prefix match. between 1 and 3

Indentifier = 1.

Question 3 - What will the next hop be for these 3 IP addresses

192.24.6.0 => D

192.24.14.32 => B.

192.24.54.0 => D

Subnet Mask of first prefix: 11111111.11111111.11000000.00000000

Subnet Mask of second prefix: 11111111.11111111.11111100.00000000

first IP - 192.24.0.0/18 using bitwise and Subnet 1 = 192.24.0.0

192.24.12.0/22 When using bitwise and first Subnet = 192.24.0.0 and using bitwise with Second Subnet mask = 192.24.12.0 which means it's next hop is B.

192.24.54.0 using Subnet = 192.24.0.0 and with Second Subnet its 192.24.52.0

So its next hop will be D

Question 4. - TCP Header.

Source Port	Destination Port
Sequence Number	
Acknowledgment number	
DO | RSV | Flags	Window
Checksum	Urgent Pointer
Options	

Source Port - The Sending devices port

Destination port - The receiving devices port.

Seq Num - A device initiating a TCP Connection must choose a Random initial Sequence number. Which is then incremented. according to the number of transmitted bytes.

The receiving device maintains an acknowledgment number starting with zero. It increments this number according to the number of bytes received. Acknowledge Num:

TCP data offset – This specifies the size of the TCP header, expressed in 32-bit words. One word represents four bytes.

Reserved data – The reserved field is always set to zero.

Control flags – TCP uses nine control flags to manage data flow in specific situations, such as the initiating of a reset.

Window size TCP checksum – The sender generates a checksum and transmits it in every packet header. The receiving device can use the checksum to check for errors in the received header and payload.

Urgent pointer – If URG control flag is set, this value indicates an offset from the sequence number, indicating the last urgent data byte.

mTCP optional data – These are optional fields for setting maximum segment sizes, selective acknowledgments and enabling

window scaling for more efficient use of high-bandwidth networks.

Attach Wireshark files to Repo.

Question 5 - UDP Header.

Source Port	Destination Port
Length	Checksum

Source Port : The port of the device sending the data

Dest Port : Port of the device receiving data.

Length : Specifies ther number of bytes Compeising the UDP header and the UDP payload data

Checksum : The checksum allows the receiving device to Veeify the integeity of the packet header and payload.