Step 3: -- 40 points

1. Correct order of the protocol headers in HTTP packet (15 points)

From the Wireshark layers, the encapsulation for the HTTP GET packet (Frame #4) is:

1. Ethernet (Layer 2)
2. IP (Layer 3)
3. TCP (Layer 4)
4. HTTP (Application layer)

Hence, the sequence is Ethernet → IP → TCP → HTTP.

2. Correct size in bytes of the protocol headers in HTTP packet (15 points)

Frame #4 shows 166 bytes on wire:

- Ethernet Header: 14 bytes
- IPv4 Header: 20 bytes (Header Length: 20 bytes)
- TCP Header: 20 bytes (Header Length: 20 bytes)
- HTTP payload: 112 bytes (the TCP payload)

Their sum is 14+20+20+112=16614 + 20 + 20 + 112 = 16614+20+20+112=166 bytes, matching the total frame size shown by Wireshark.

3. Note of Ethernet header and payload (5 points)

The Ethernet header (14 bytes) contains destination MAC, source MAC, and EtherType.

The Ethernet payload in this case is the IP packet (consisting of IP header + TCP header + HTTP data), which in total is 166−14=152166 − 14 = 152166−14=152 bytes.

4. Note of IP header and payload (5 points)

The IP header (20 bytes for IPv4 without options) has fields like version, header length, source/destination IP, protocol number (6 for TCP), etc.

The IP payload is then the TCP segment (TCP header + HTTP data), which here is 152−20=132152 − 20 = 132152−20=132 bytes.

Step 4: -- 40 points

1. Correct value for HTTP data (10 points)

In Frame #4, Wireshark shows the TCP payload is 112 bytes, which is the HTTP GET request content (request line plus headers).

2. Correct value for Total: HTTP data and headers (10 points)

The total size of this frame on the wire is 166 bytes, encompassing all headers plus the HTTP data. Specifically:

- Ethernet (14) + IP (20) + TCP (20) + HTTP (112) = 166 bytes

3. Correct calculation method for Overhead (20 points)

Header total = 14 (Ethernet) + 20 (IP) + 20 (TCP) = 54 bytes

Total = 166 bytes

Overhead% = (54/166) ×100% ≈ 32.53%

Step 5: -- 20 points

1. Correct Ethernet header field (5 points) and correct value in this field (5 points).

Field name: EtherType

Common value: 0x0800 for IPv4

2. Correct IP header field (5 points) and correct value in this field (5 points).

Field name: Protocol (within the IPv4 header)
Value: 6, which indicates TCP