IP Datagram 1

CIS 331: Network Introduction
Lehman College, City University of New York
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Given that a frame is formatted as follows:

Destination Hardware Address	Source Hardware Address	Frame Type	Frame Data
6 Bytes	6 Bytes	2 Bytes	46 - 1500 Bytes

And given that an IP datagram is formatted as follows:

Byte	0				1				2				3			
bit	0 1 2 3	4 5 6 7	8 9 10 11	12 13 14 15	16 17 18 19	20 21 22 23	24 25 26 27	28 29 30 31
0	Version	Header Length	Type Of Service		Total Length			
4	Identification				Flags	Fragment Offset		
8	TTL		Type		Header Checksum			
12	Source IP Address							
16	Destination IP Address							
	IP Options (May Be Omitted)						Padding	
20	IP Payload Data							

And given that a UDP datagram is formatted as follows:

Byte	0				1				2				3			
bit	0 1 2 3	4 5 6 7	8 9 10 11	12 13 14 15	16 17 18 19	20 21 22 23	24 25 26 27	28 29 30 31
0	UDP Source Port				UDP Destination Port			
4	UDP Message Length				UDP Checksum			
20	UDP Payload Data							

And given the following frame with an encapsulated IP datagram:

```
2B   5B   D6   EB   55   64   CA   36   FA   27   BE   20   08   00   45   05
00   72   7A   90   24   DA   7E   5B   38   12   7D   0D   97   16   C4   AB
51   0F   03   A1   60   53   FD   A4   D0   7E   84   50   CF   EE   7B   BB
55   28   51   02   EA   99   FE   11   5E   96   BC   25   48   3F   5A   4D
97   D1   9D   CA   28   E5   AF   84   D2   A7   04   96   4D   3F   7C   D2
4A   7B   94   D3   35   C4   97   36   BF   FF   9A   A9   3B   43   29   67
6E   73   71   0F   45   92   41   CF   7F   D0   60   CA   0D   99   8A   80
A2   48   D6   CA   02   FF   ED   78   E5   FC   2A   6E   F3   42   C2   1C
```

1. Find the source hardware address.
2. Find the destination hardware address.
3. What type of frame is this?
4. What Flag(s) are set?
5. What is the fragment offset?
6. What is the TTL count?
7. What is the Header Checksum?
8. If the header includes no options or padding, what are the first five bytes of the datagram data?
9. Find the destination IP address.

10. What class is the destination IP address?
11. What is the network ID in the destination address?
12. What is the host ID in the destination address?
13. Write the destination IP address in dotted decimal notation.
14. Find the source IP address.
15. What class is the source IP address?
16. What is the network ID in the source address?
17. What is the host ID in the source address?
18. Write the source IP address in dotted decimal notation.
19. Can this message be delivered directly by the source to the destination, or will it require routers to handle the message. Explain.
20. What is the UDP source port?
21. What is the UDP destination port?
22. What is the UDP message length?
23. What is the UDP checksum?