Answer 1:

a) Yes, Y's adapter will still receive and check these frames because they are sent over the same broadcast LAN.
b) No, y's adapter will not pass the datagrams in these frames.
c) If X sends frames with the broadcast MAC address. Then Y’s adapter will pass the datagrams in these frames because broadcast frames are delivered to all devices on the LAN. If the frames contain datagrams that are intended for Y, then Y's adapter will pass them to the network layer of Y.
d) The number of possible MAC addresses is 2^48, which is approximately 281 trillion.

Answer 2:

a) It will be discarded by all devices on the network, In other words the receiving device drops the frame.

b) They use cyclic redundancy check (CRC) for error checking.

c) The preamble consists of 56 bits (seven-byte) pattern of alternating 1s and 0s that serves to provide bit-level synchronization between devices on the network, allowing them to easily synchronize their receiver clocks and mark the beginning of a new incoming frame.

d) In half-duplex mode, data can only be sent and received at different times, whereas in full-duplex mode, both can be sent and received simultaneously.

e) Autonegotiation fails when a device set to auto-negotiation is connected to a device not set to auto-negotiation. Autonegotiating is still capable of detecting the speed of the other end of the connection, but cannot correctly detect duplex mode.

Answer 3:

a:

① 2006

1	0	1	1	1
0	0	0	1	1
0	1	1	1	0 ←
1	1	0	0	0
0	0	1	1	0
		↑		

⇒

Corrected

1	0	1	1	1
0	0	0	1	1
0	1	0	1	0
1	1	0	0	0
0	0	1	1	0

~~Correct~~ & Correct 25 Bit message :-
1011 1 0001 1 0101 0 1100 0 00110

- As it is clearly visible there is error in the Column 3rd and Row 3rd
So to Get even Parity in 3rd Row & Column there is need to change 1 at Position (3,3) (3rd Row, 3rd Column) to 0.

So after changing $1 \to 0$ we will even get even Parity for every Row and Column.

②

0	0	0	1	1
0	1	1	0	1 ←
0	0	1	1	1 ←
1	0	1	0	0
1	0	0	0	1
	↑	↑		

in the Given message there is error in 3rd and 2nd Row.

For 2nd Row (0+1+1+0) there Sum Should Be ~~even~~ odd as Parity Bit is one → then only we Can Get Get even Parity

- For 3rd Row (0+0+1+1) Sum should also Be odd as Parity But is 1.

Column wise there is error in 2nd and 3rd column as there parity bits are 0 but (0+1+0+0), (0+1+1+1) sums are odd so we don't have even parity.

Now here are two possible solution

0	0	0	1	1	
0	1	1	0	1	←
0	0	1	1	1	←
1	0	1	0	0	
1	0	0	0	1	
	↑	↑			

0001 0010 0001 101011
1010001

OR

0	0	0	1	1	
0	1	1	0	1	←
0	0	1	1	1	←
1	0	1	0	0	
1	0	0	0	1	
↑	↑				

0001 0100 0011 1010 1110 1000 1

So, one of them is wrong for sure, so, we can't correct it.

- Moreover it is 2-bit error so two-D parity can catch all 2-bit errors message.

Answer 3. c:

2x100 − 2

10080 Bits

1 KiBiByte = 1024 Byte

1 Byte = 8 Bits

8 KiBiByte = $8 \times 1024 \times 8$ = Bits.

~~= 16384 Bits~~

= 65536 Bits

The Square root of 65536 is 256

So ~~it~~ we will have Grid of 256×256 which include data Bits and Parity Bits.

256 Row will have 256 Parity Bits and 256 Column will have 256 Parity Bits, But Parity Bit will Be Common Between them So there will $256 + 256 - 1 = 511$ Parity Bits.